GRUNDIG SERVICE MANUAL

LIVE CAM

Service Manual
LC 232 E
Sach-Nr./Part No.
72010-511.90

weitere Unterlagen für den Komplettservice:

Additional Service Manuals for the Complete Service:

Service Manual
Video 8 / A Mechanism
Sach-Nr./Part No.
72010-512.16

Service Manual
NA 8 - 1
Sach-Nr./Part No.
72010-507.66

Ⓓ Btx * 32700 #

LC 232 E

LC 232 E (G.MC 6800 / 75981-288.00)

Ⓓ

Technische Daten

Camera	
- Aufnahmeelement:	1/3" CCD Halbleiter-Chip
- Auflösung:	320 000 Bildpunkte
- Beleuchtungsbereich:	3 - 100 000 Lux
- Mindestbeleuchtung:	3 Lux
- Zoombereich:	10-fach Motor-Zoom 6,1 - 61 mm mit 2 Geschwindigkeiten
- Auto-Fokus-System:	Digital Full Range Autofocus
- Filtergewindedurchmesser:	37 mm
- Lichtstärke (Optik):	1 : 1,6
Video	
- Aufnahmesystem:	2 rotierende Köpfe, Schrägspurverfahren, PAL
- Bandformat:	8 mm Videocassetten (Standard)
- Bandgeschwindigkeit:	Standard play (SP) 20,051mm/s Longplay (LP) 10,058 mm/s
- Aufnahme-/Wiedergabezeit:	SP: 1 Std. 30 min. / LP: 3 Std.
Audio	
- Aufzeichnungsverfahren:	rotierende Köpfe, Schrägspurverfahren FM
- Mikrofon:	Elektret-Kondensator-Mikrofon (mono)
Anschlußmöglichkeiten	
- Videoausgangsbuchse:	Cinchbuchse; 1 Vss, 75 Ω, unsymmetrisch, Sync. negativ
- Audioausgangsbuchse:	Cinchbuchse (1); -7,5 dBm, Impedanz weniger als 1 KΩ bei einer Belastung von 47 kΩ
- Fernbedienbuchse:	Stereoklinkenbuchse 2,5 mm
- Mikrofonbuchse:	Klinkenbuchse 3,5 mm, -66 dBm, Impedanz 6,8 kΩ, mit 2,5 V - 3 V Gleichspannungsausgang
- Kopfhörerbuchse:	Klinkenbuchse 3,5 mm, 8 Ω Impedanz
Betriebsspannung	
- Akkubetrieb:	6,0 V
- Netzteilbetrieb:	7,5 V
Leistungsaufnahme	Aufnahmebetrieb 5,7 W (mit Monitor)
Allgemeines	
Gewicht:	ca. 820 g (ohne Akkusatz und Lithium-Batterie, Cassette, Objektivabdeckung, Buchsenabdeckung und Schulterriemen)
Sucher:	0,7" Suchermonitor (schwarz/weiß)
Arbeitstemperatur:	0° C bis 40° C

(GB)

Technical Data

Camera	
- Image device:	1/3" CCD Charge Coupled Device
- Definition:	320 000 Pixel
- Illumination range:	3 - 100 000 Lux
- Minimum illumination:	3 Lux
- Zoom range:	10-fold motor zoom 6.1 - 61 mm with 2 speeds
- Auto focus system:	Digital Full Range Autofocus
- Filter thread diameter:	37 mm
- Luminous intensity (Optic):	1 : 1.6
Video	
- Video recording system:	2 Rotating heads, Helical scanning FM system, PAL
- Tape format:	8 mm video format cassette
- Tape speed:	Standard play (SP) 20.051mm/s Longplay (LP) 10.058 mm/s
- Rec. and Playback Time:	SP: 1 h 30 min. / LP: 3 h
Audio	
- Audio recording system:	Rotary head, FM system
- Microphone:	Electret condenser microphone (monaural type)
Connections	
- Video output socket:	Cinch jack; 1 Vpp, 75 Ω, unbalanced, sync. negative
- Audio output socket:	Cinch jack (1); -7.5 dBs, impedance less than 1 kΩ at a load of 47 kΩ
- Remote jack:	Stereo mini-minijack
- MIC jack:	minijack, -66 dBs, impedance 6.8 kΩ, with 2.5 V - 3 V DC output
- Headphone jack:	minijack, 8 Ω impedance
Power requirements	
- Battery pack:	6.0 V
- AC power adaptor:	7.5 V
Power consumption	Camera recording 5.7 W (with viewfinder)
General	
Weight:	Approx. 820 g (excluding the battery pack, lithium battery, cassette, lens cap, jack cover and shoulder strap)
Viewfinder:	0.7" Viewfinder (black/white)
Operating temperature:	0° C to 40° C

Printed in Germany/Japan
VK 2221 1192

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Notizen / Notes

Allgemeiner Teil

Sicherheitsausgangsprüfung

Nachdem Sie die Reparatur beendet haben, überprüfen Sie folgende Punkte, bevor Sie das Gerät an den Kunden zurückgeben:

1. Überprüfen Sie den Bereich Ihrer Reparatur auf fehlende oder schlechte Lötstellen. Kontrollieren Sie die ganze Platinenoberfläche auf Zinnspritzer und Kurzschlüsse.
2. Überprüfen Sie die Platinenverbindungen, und stellen Sie sicher, daß keine Leitungen eingequetscht werden oder Hochlast-Widerstände berühren.
3. Achten Sie auf unerlaubte Ersatzteile, insbesondere Transistoren, die bei früheren Reparaturen eingebaut wurden. Weisen Sie den Kunden darauf hin und empfehlen Sie den Austausch.
4. Achten Sie auf Teile, die zwar noch funktionieren, aber offensichtliche Abnutzungserscheinungen zeigen. Weisen Sie den Kunden darauf hin und empfehlen Sie den Austausch.

General Section

Safety Check-out

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particulary transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.

Sicherheitsvorschriften / Safety requirements / Prescrizioni de sicurezza / Prescriptions de sécurité / Prescripciones de seguridad

D

Achtung: Bei Eingriffen ins Gerät sind die Sicherheitsvorschriften nach VDE 0701 (reparaturbezogen) bzw. VDE 0860 / IEC 65 (gerätebezogen) zu beachten!

⚠ Bauteile nach IEC- bzw. VDE-Richtlinien ! Im Ersatzfall nur Teile mit gleicher Spezifikation verwenden!

MOS - Vorschriften beim Umgang mit MOS - Bauteilen beachten!

GB

Attention: Please observe the applicable safety requirements according to VDE 0701 (concerning repairs) and VDE 0860 / IEC 65 (concerning type of product)!

⚠ Components to IEC or VDE guidelines! Only use components with the same specifications for replacement!

Observe **MOS** components handling instructions when servicing!

I

Attenzione: Osservarne le corrispondenti prescrizioni di sicurezza VDE 0701 (concernente servizio) e VDE 0860 / IEC 65 (concernente il tipo di prodotto)!

⚠ Componenti secondo le norme VDE risp. te IEC! In caso di sostituzione impiegare solo componenti con le stesse caratteristiche.

Osservare le relative prescrizioni durante, lavori con componenti **MOS**!

F

Attention:
Prière d'observer les prescriptions de sécurité VDE 0701 (concernant les réparations) et VDE 0860 / IEC 65 (concernant le type de produit)!

⚠ Composants répondant aux normes VDE ou IEC. Les remplacer uniquement par des composants ayant les mêmes spécifications.

Lors de la manipulation des circuits **MOS**, respecter les pescriptions **MOS**!

E

Atención: Recomendamos las normas de seguridad VDE u otras normas equivalentes, por ejemplo: VDE 0701 para reparaciones, VDE 0860 / IEC 65 para aparatos!

⚠ Componentes que cumplen las normas VDE/IEC. En caso de sustitución, emplear componentes con idénticas especificaciones!

Durante la reparacion observar las normas sobre componentes **MOS**!

Behandlung von Bauteilen in MOS-Technik

Schaltungen in **MOS**-Technik bedürfen einer besonderen Vorsicht gegenüber statischer Aufladung.
Statische Aufladungen können an allen hochisolierenden Kunststoffen auftreten und auf den Menschen übertragen werden, wenn Kleidung und Schuhe aus synthetischem Material bestehen.
Schutzstrukturen an den Ein- und Ausgängen der MOS-Schaltungen geben wegen ihrer Ansprechzeit nur begrenzte Sicherheit.
Bitte beachten Sie folgende Regeln, um Bauelemente vor Beschädigung durch statische Aufladungen zu schützen:

1. **MOS**-Schaltungen sollen bis zur Verarbeitung in elektrisch leitenden Verpackungen verbleiben. Keinesfalls **MOS**-Bauteile in Styropor oder Plastikschienen lagern oder transportieren.
2. Personen müssen sich durch Berühren eines geerdeten Gegenstandes entladen, bevor sie **MOS**-Bauteile anfassen.
3. **MOS**-Bauelemente dürfen nur am Gehäuse angefaßt werden, ohne die Anschlüsse zu berühren.
4. Prüfung und Bearbeitung darf nur an geerdeten Geräten vorgenommen werden.
5. Lösen oder kontaktieren Sie **MOS**-ICs in Steckfassung nicht unter Betriebsspannung.
6. Bei p-Kanal- **MOS**-Bauelementen dürfen keine positiven Spannungen (bezogen auf den Substratanschluß VSS) an die Schaltung gelangen.

Lötvorschriften für MOS-Schaltungen

- Nur netzgetrennte Niedervoltlötkolben verwenden.
- Maximale Lötzeit 5 Sekunden bei einer Kolbentemperatur von 300 bis 400° C.

Handling of MOS Chip Components

MOS circuits require special attention with regard to static charges.

Static charges may occur with any highly insulating plastics and can be transferred to persons wearing clothes and shoes made of synthetic materials.
Protective circuits on the inputs and outputs of MOS circuits give protection to a limited extent only due to the time of reaction.
Please observe the following instructions to protect the components against damages from static charges:

1. Keep **MOS** components in conductive packages until they are used. **MOS** components must never be stored or transported in Styropor materials or plastic magazines.
2. Persons have to rid themselves of electrostatic charges by touching a grounded object before handling MOS components.
3. Take the chip by the body without touching the terminals.
4. Use only grounded instruments for testing and processing purposes.
5. Remove or connect **MOS** ICs with in mounting sockets only if the operating voltage is disconnected.
6. The circuits of p-channel **MOS** components must not be connected to positive voltages (with reference to bulk VSS).

MOS Soldering Instructions

- Use only mains isolated low-voltage soldering irons.
- Maximum soldering period 5 seconds at a soldering iron temperature of 300 to 400 degrees Celsius.

D Sicherheitshinweise zu Lithium-Batterien

Vorsicht bei Lithium-Batterien:

Bei falscher Handhabung (Überhitzung, Falschpolung oder Kurzschluß) der Lithium-Batterien besteht Explosionsgefahr!
Lithium-Batterien dürfen **nur** gegen **Original-Ersatzteile** (s. Ersatzteilliste) getauscht werden.
Die verbrauchten Lithium-Batterien entsorgen Sie bitte fachgerecht.

GB USA U.S. & Canada

Safety cautions for Lithium Batteries

Warning! Lithium Batteries:

Wrongly used lithium batteries (excessive heat, wrong connection of terminals, short circuit) represent a danger of explosion!
Lithium batteries must be replaced **only by original spare parts** (see Spare Parts List).
Please observe the appropriate disposal regulations for exhausted lithium batteries.

DK Adversel!

Lithiumbatterie-Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type.
Levér det brugte batterie til de offentlige indsamlingssteder.

S Varning

Eksplosionsfara vid felaktigt batteribyte. Använd samma batterityp eller ekvivalent typ som rekommenderas av apparattillverkaren.
Kassera använt batteri enligt fabrikantens instruktion.

SF Varoitus

Paristo voi räjähtää, jos se on virheellisesti asennettu.
Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

CHIP Technik

Das Gerät ist vorwiegend in Chip Technologie aufgebaut. Nachfolgend beschreiben wir Ihnen den Umgang mit CHIP Bauteilen beim Service.

AUS- UND EINBAUEN VON CHIPBAUTEILEN

- Verwenden Sie nur einen Niedervoltlötkolben mit Temperaturregelung.
- Die Löttemperatur sollte ca. 240°C betragen, max. 300°C.
- Die Lötzeit halten Sie bitte so kurz wie möglich.
- Belassen Sie CHIP- Bauteile bis zur Bearbeitung in der Originalverpackung. Damit wird die Oxidation der Stirnkontakte vermieden.
- Berühren Sie CHIP- Bauteile nicht mit der bloßen Hand.

AUSLÖTEN VON CHIPS

1. Schritt: CHIP- Lötstelle mit Sauglitze absaugen. (Bild CH1)

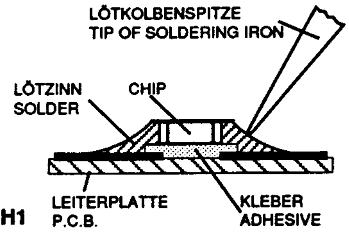


Bild CH1

2. Schritt: CHIP- Enden, bzw. das komplette CHIP-Bauteil erwärmen. CHIP von der Klebung ohne Kraftaufwand abdrehen, damit unter dem CHIP liegende Leiterbahnen nicht abgerissen werden. (Bild CH2)

ACHTUNG! Ausgelötetes CHIP nicht wiederverwenden! Die leitende Schicht kann ausgebrochen sein.

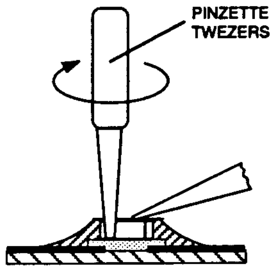


Bild CH2

EINLÖTEN VON CHIPS

3. Schritt: Lötpunkt von Lötrückständen säubern. Lötperle anbringen. (Bild CH3)

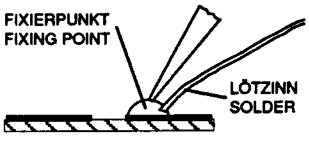


Bild CH3

4. Schritt: CHIP an der Lötstelle ansetzen, zentrieren und anlöten. CHIP nur am Konaktende mit der Pinzette anfassen. (Bild CH4)

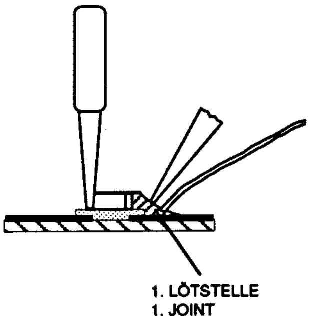


Bild CH4

5.Schritt: Freie Seite löten, und nach dem Erkalten die erste Lötstelle nochmals nachlöten. (Bild CH5)

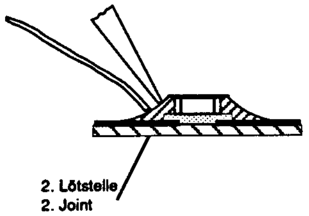


Bild CH5

CHIP Technology

The set has been fabricated utilizing primarily the chip technologies. Please, follow the instructions below when carrying out repair works.

SOLDERING AND UNSOLDERING OF CHIP COMPONENTS

- Use only low-voltage soldering irons with temperature control.
- Permissible soldering temperatures are approx. 240°C up to max. 300°C.
- Keep the soldering period as short as possible.
- Keep the CHIP components in their original packages until they are used to avoid oxidation of the end contacts.
- Do not touch CHIP components with bare hands.

UNSOLDERING OF CHIPS

1st step: Clean the CHIP soldering point with a solder wick. (Fig. CH1)

Fig. CH1

2nd step: Warm up the ends of the CHIP or the whole CHIP component and remove the CHIP from the adhesive by turning it without application of force so that the tracks beneath the CHIP do not break. (Fig. CH2)

ATTENTION! Do not use unsoldered CHIPS any more because the conductive layer may be broken.

Fig. CH2

SOLDERING OF CHIPS

3rd step: Remove possible residues from the soldering point. Then apply a solder bead. (Fig. CH3)

Fig. CH3

4th step: Put the CHIP onto the soldering point, then center and fix it.Use tweezers to hold the CHIP only at the end of the contact. (Fig. CH4)

Fig. CH4

5th step: Solder the free end of the CHIP and resolder the first soldering point after it has cooled. (Fig. CH5)

Fig. CH5

LC 232 E Servicemittel / Service Jigs and Tools

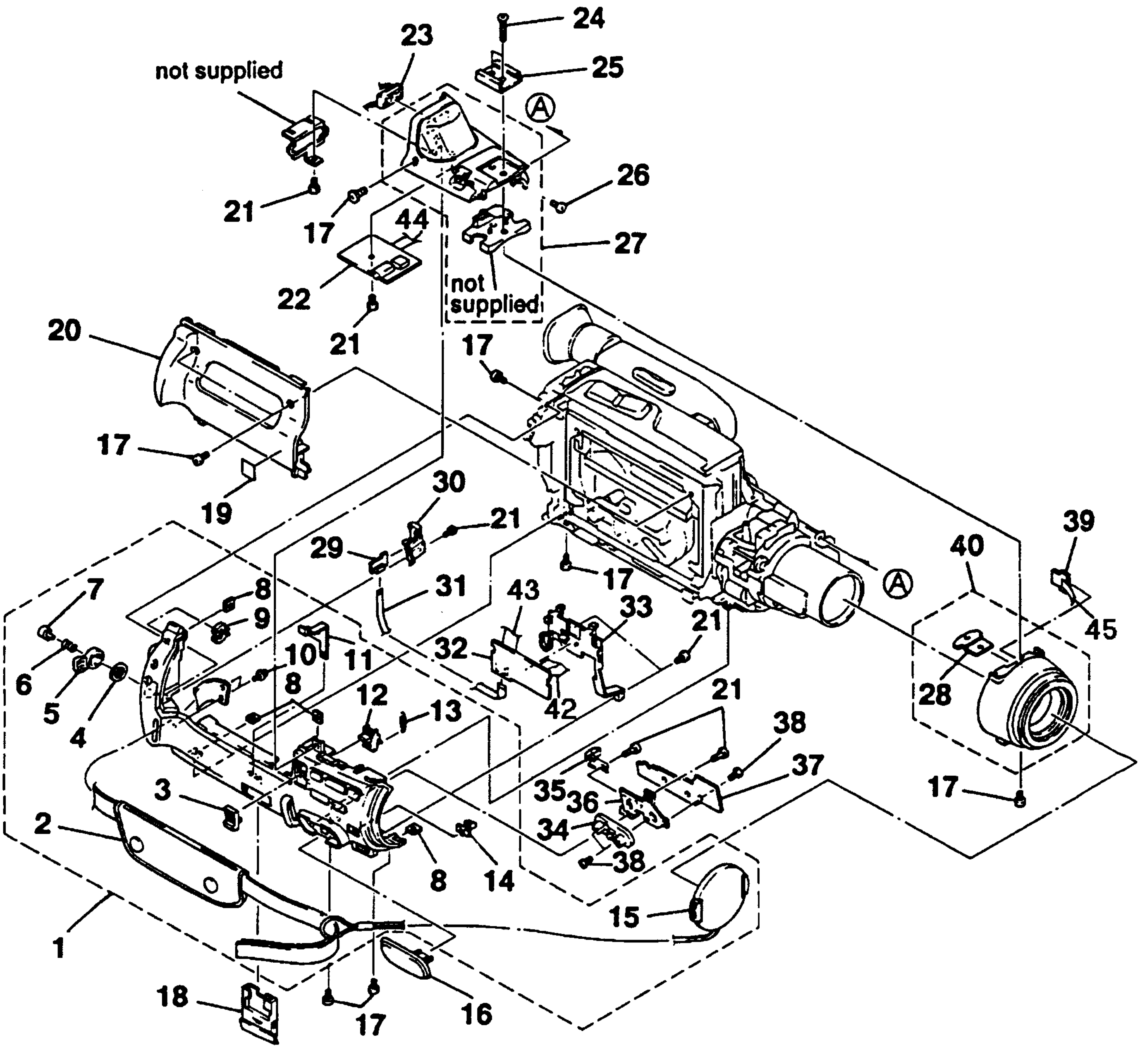
Stück **Piece**	**Bezeichnung** **Description**	**Sach-Nr.** **Part No.**	**Sony-Nr.** **Sony No.**
2	ND-Filter / ND Filter (1.0)	75987-532.04	J-6080-808-A
1	Öl / Oil (Mitsubishi Diamond Oil Hydrofluid NT-68)	75987-526.71	7-661-018-18
1	Testband / Alignment Tape WR 5-1 C P	75987-561.62	8-967-995-07
1	Testband / Alignment Tape WR 5-6 C	75987-526.56	8-967-995-17
1	Testband / Alignment Tape WR 5-5 CSP	75987-526.57	8-967-995-47
1	Testband / Alignment Tape WR 5-4 CL	75987-526.58	8-967-995-56
1	Farbtestbild für Lichtbox / Colour Chart for Pattern Box	—	J-6020-250-A
1	Lichtbox / Pattern box PTB-500	—	J-6029-140-A
1	Filter (C14)	75987-532.01	J-6080-054-A
1	Filter (für gutes Wetter / for fine weather)	75987-536.43	J-6080-058-A
1	ND-Filter / ND Filter (0.4)	75987-532.02	J-6080-806-A
1	ND-Filter / ND Filter (0.1)	75987-532.03	J-6080-807-A
1	ND-Filter / ND Filter (0.3)	75987-536.44	J-6080-818-A
1	Bedieneinheit für Einstellarbeiten (RM 95B) / Adjustment Remote Control	75987-561.68	J-6082-053-B
1	Messadapter für das Kamerateil / Measuring Pin for Camera Section	75981-274.06	J-6082-139-A
1	GRUNDIG-Testbildsatz / GRUNDIG-Set of Test Charts	75987-358.56	—
1	Schwarz-weiß Testbild / Black-white Test Pattern (1189mm x 841mm)	—	—
1	Verlängerungskabel / Extension Cable (30P) 0,8mm	75981-282.01	J-6082-167-A
1	Verlängerungskabel / Extension Cable (40P) 0,8mm	75981-282.02	J-6082-168-A
1	Verlängerungskabel / Extension Cable (20P) 0,8mm **(neu! / new!)**	75981-288.41	J-6082-169-A
1	Verlängerungskabel / Extension Cable (18P) 0,8mm	75981-282.03	J-6082-170-A
1	Verlängerungskabel / Extension Cable (21P) 0,5mm	75981-282.04	J-6082-171-A
1	Verlängerungskabel / Extension Cable (15P) 0,8mm	75981-282.05	J-6082-172-A
1	Verlängerungskabel / Extension Cable (8P) 0,8mm	75981-282.06	J-6082-173-A

Die Servicemittel für die Mechanik des Camcorders LC 232 E sind im Service Manual (Sachnr. 72010-512.16) A-Mechanik aufgelistet.

The Service Jigs and Tools for the mechanic of the camcorder LC 232 E are listed in the Service Manual (Part No. 72010-512.16) for the A-Mechanic .

Explosionszeichnungen / Exploded Views

1. Linkes Gehäuseteil / Cabinet (upper), (L) Assemblies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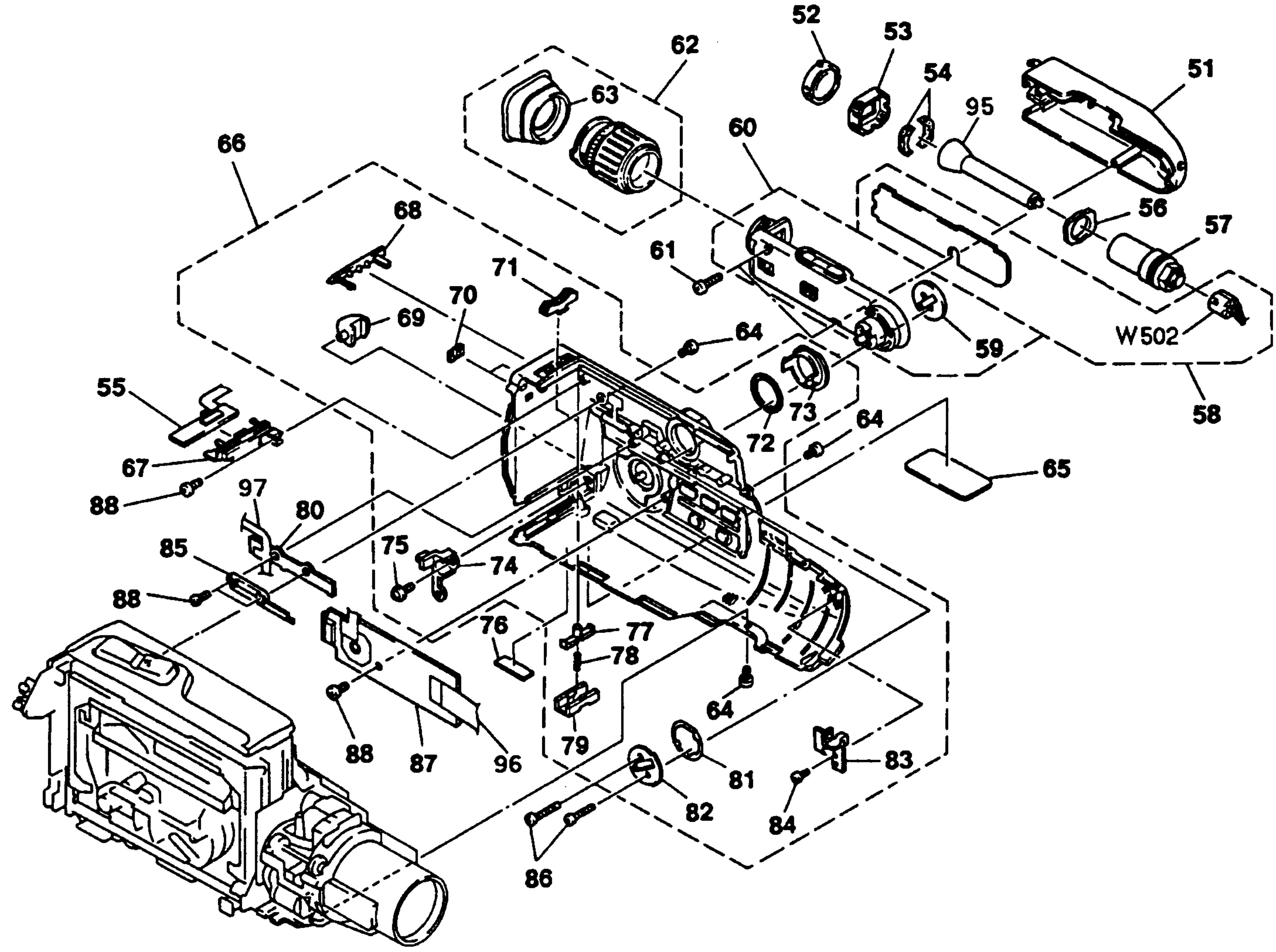
2. Rechtes Gehäuseteil und Suchermonitor / Cabinet (R), EVF Assemblies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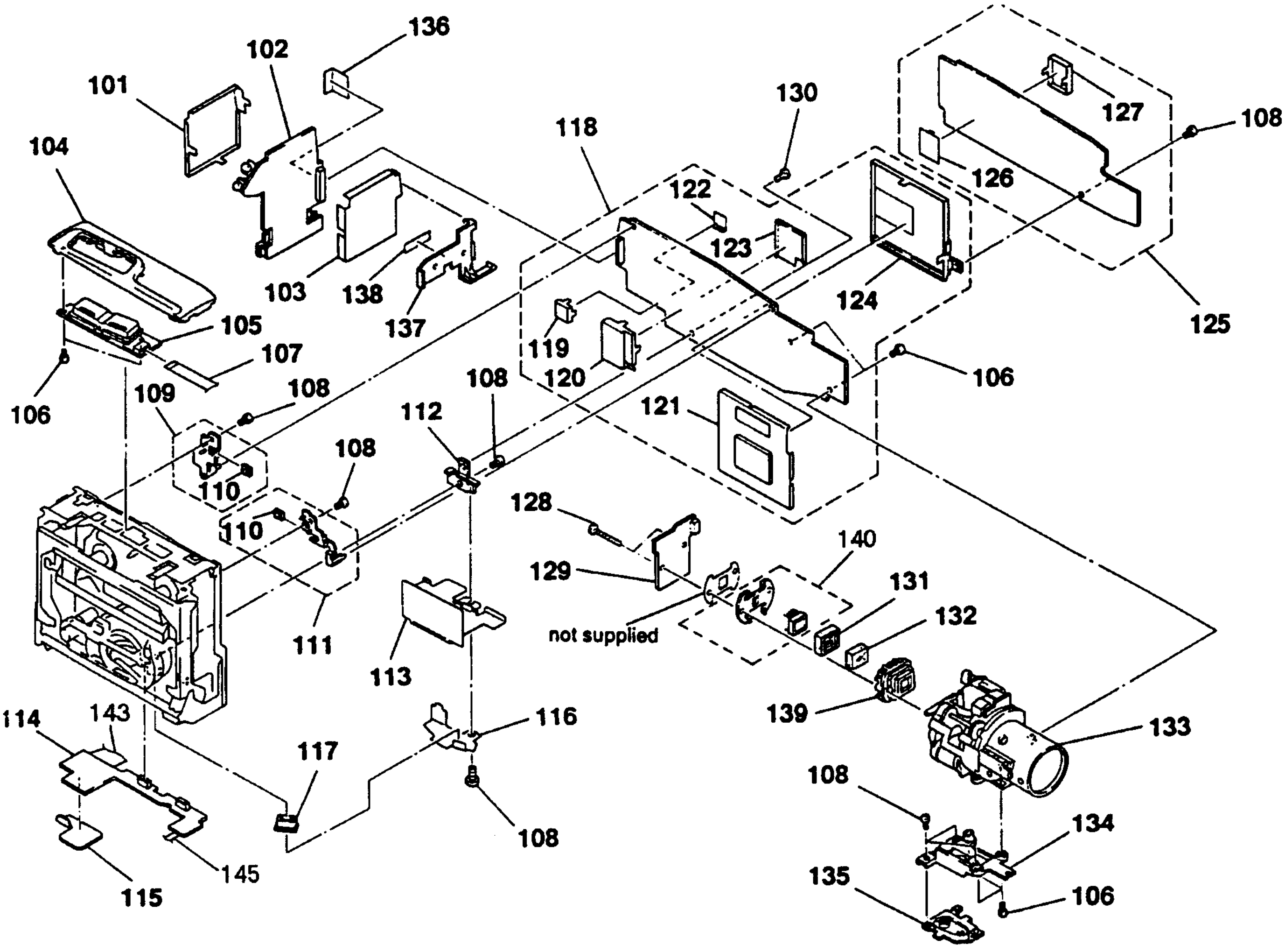
3. Hauptplatinen / Main Board Assembly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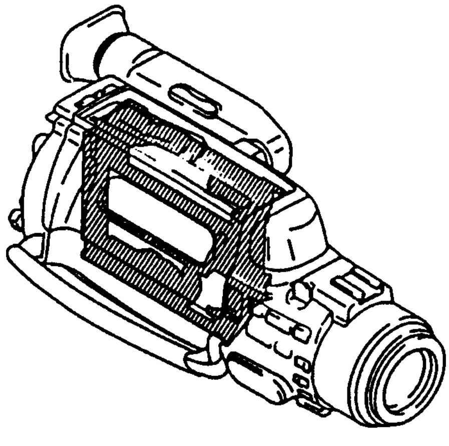
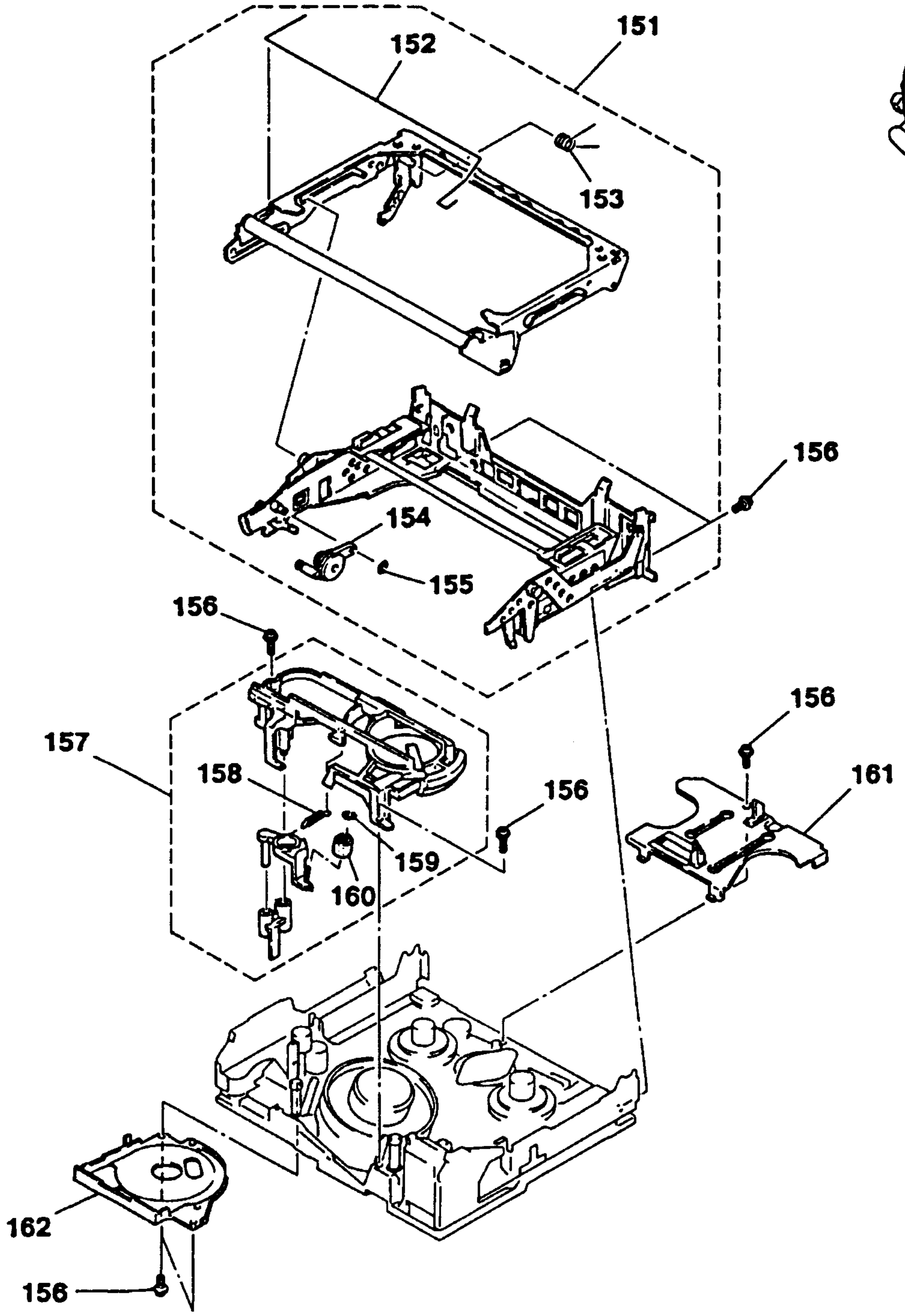
4. Cassettenschacht / Cassette Compartment Assembly

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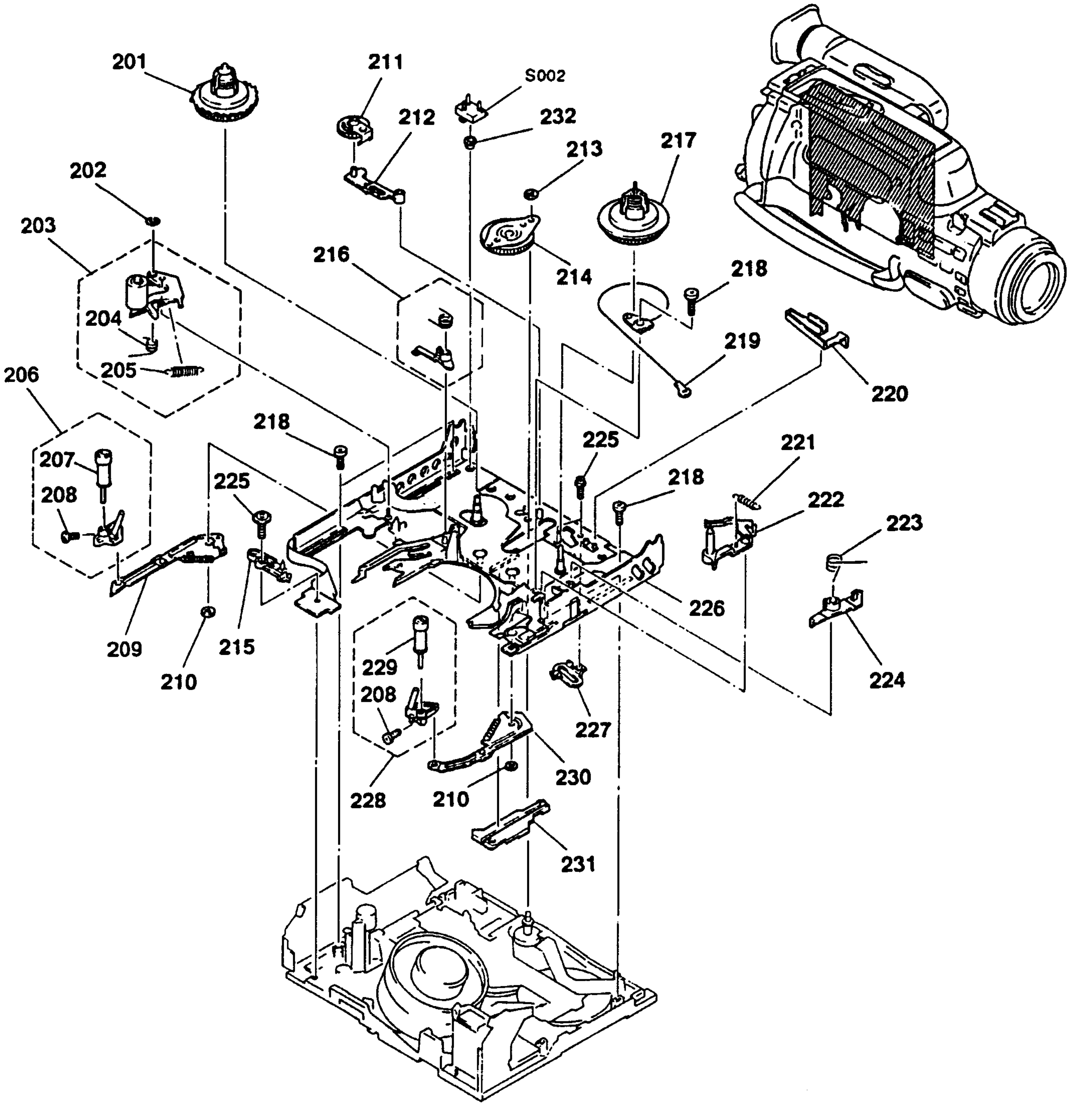
5. Chassis / LS Chassis Assembly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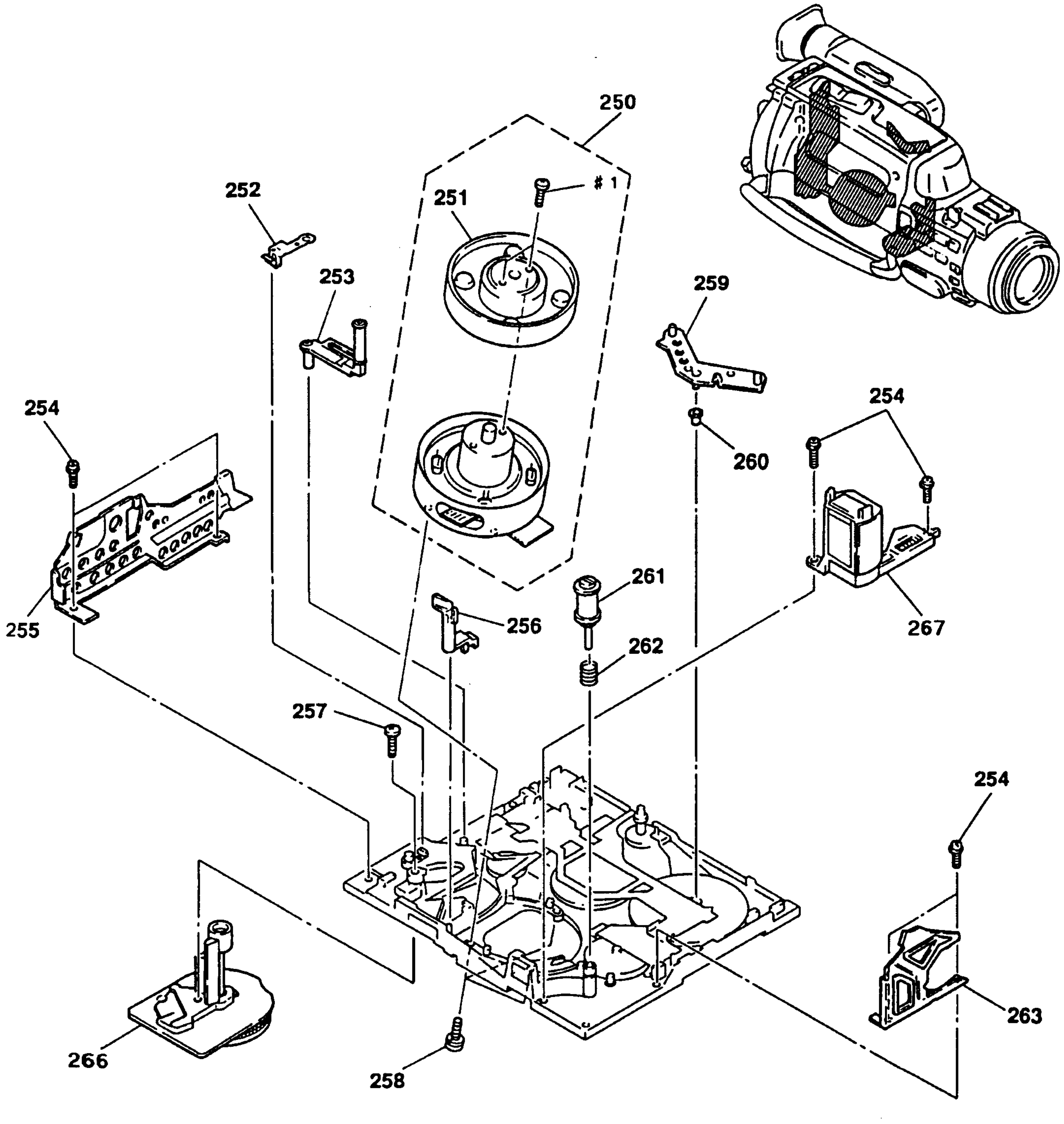
6. Laufwerk (1) / Mechanism Chassis Assembly (1)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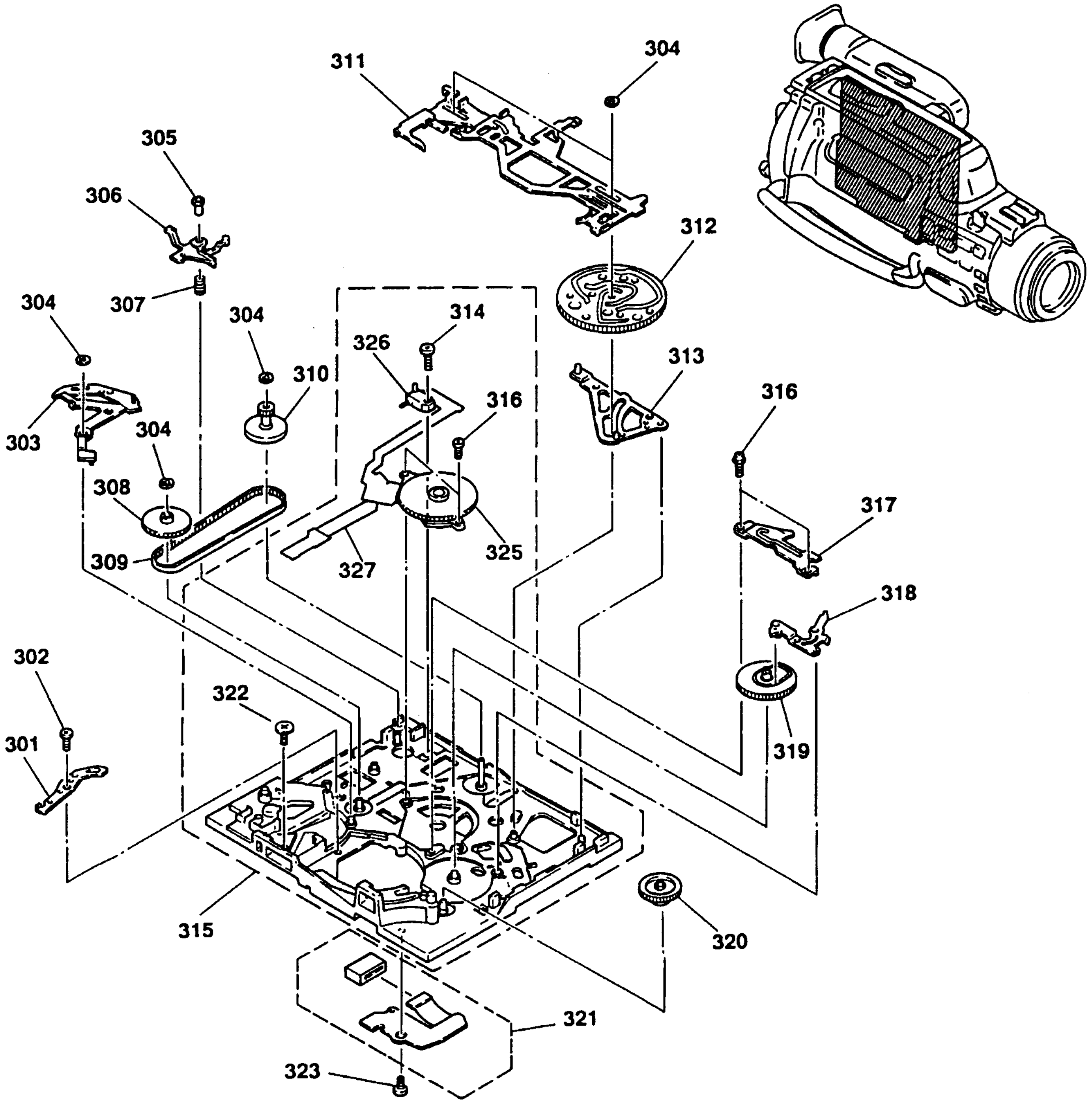
7. Laufwerk (2) / Mechanism Chassis Assembly (2)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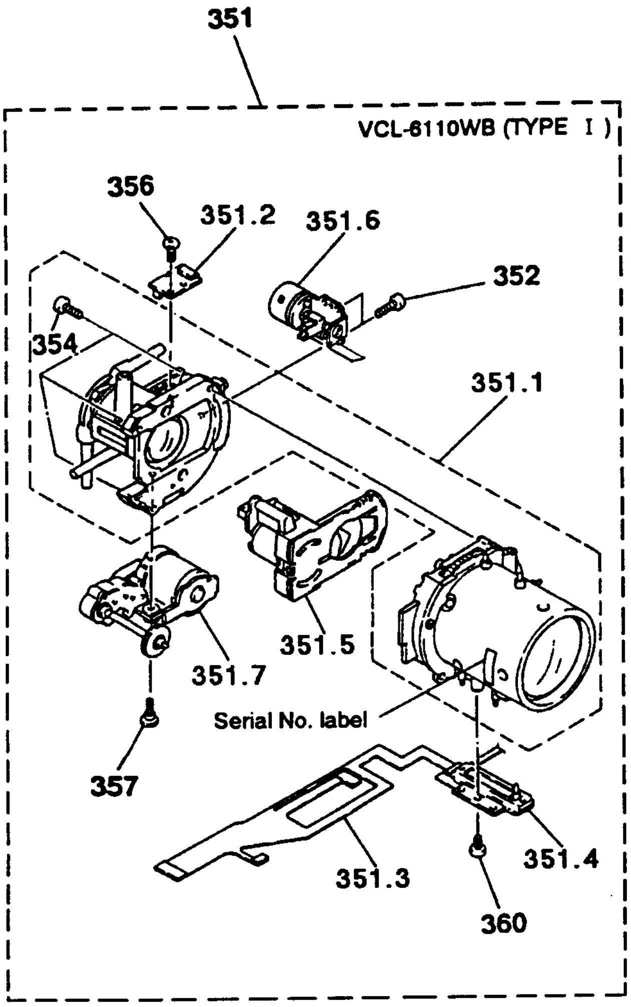
8. Optik / Zoom Lens Assembly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VCL-6110WB (TYPE I)
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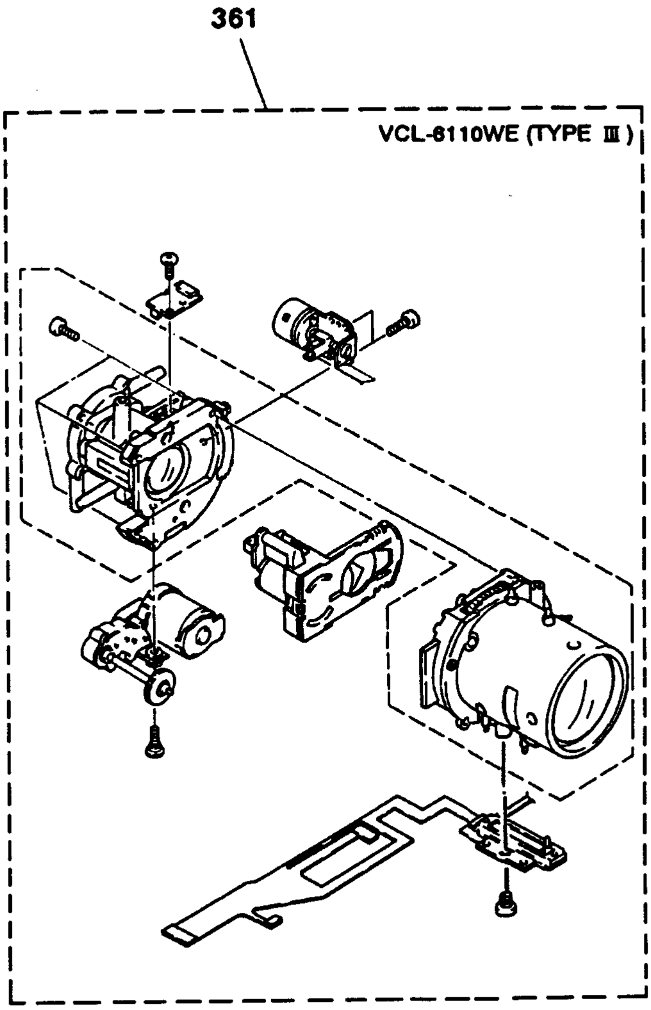
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VCL-6110WE (TYPE III)

GRUNDIG Ersatzteilliste
List of spare parts

(D) Btx ∗ 32700 #

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LC 232 E

SACH-NR. / PART NO.: 75981-288.00
BESTELL-NR. / ORDER NO.: G.MC 6800

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG (D)	DESCRIPTION (GB)
0001.000	1	75981-288.06		GEHAEUSETEIL, LINKS	HOUSING PART, LEFT
0002.000	1	75987-535.08		HALTERIEMEN	HAND STRAP
0003.000	1	75981-282.17		KNOPF	KNOB
0004.000	1	75987-535.25		FEDER	SPRING
0005.000	1	75981-274.09		KNOPF, STAND-BY	KNOB, STAND-BY
0006.000	1	75987-535.22		DRUCKFEDER	PRESSURE SPRING
0007.000	1	75987-535.23		TASTE	KEY
0008.000	1	75987-560.47		PLATTE	PLATE
0009.000	1	75981-282.18		HALTER	HOLDER
0011.000	1	75981-282.19		BATTERIEHALTER	BATTERY HOLDER
0012.000	1	75981-282.20		VERRIEGELUNG	LOCKING
0013.000	1	75981-282.21		FEDER	SPRING
0014.000	1	75981-288.13		TASTE	KEY
0015.000	1	75981-282.22		LINSENABDECKUNG	LENS COVER
0016.000	1	75981-288.11		BUCHSENABDECKUNG	SOCKET COVER
0017.000	1	75987-560.60	7	SCHRAUBE M2	SCREW
0018.000	1	75981-288.09		HALTER F. LITHIUMBATTERIE	HOLDER F. LITHIUMBATTERY
0020.000	1	75981-288.10		CASSETTENDECKEL	CASSETTE LID
0022.000	1	75981-288.14		MIKROFONVERSTAERKER, MA-155	MIC AMP, MA-155
0023.000	1	75981-288.15		MIKROFON	MICROPHONE
0025.000	1	75987-527.04		HALTESCHUH	EVF - SHOE
0027.000	1	75981-288.05		GEHAEUSETEIL, OBEN	HOUSING PART, UPPER
0029.000	1	75981-282.28		BEDIENPLATTE, START/STOP	CONTR.BOARD, START/STOP
0030.000	1	75981-282.27		SCHALTERHALTER	SWITCH BRACKET (HOLDER)
0031.000	1	75981-282.29		FLEXIBLE LEITUNG, FFC-33	FLEXIBLE CABLE, FFC-33
0032.000	1	75981-288.16		BEDIENTEILPLATTE RECORDER,VK-28	VTR CONTROL SWITCH, VK-28
0034.000	1	75981-288.17		BUCHSENPLATTE	SOCKET BOARD
0037.000	1	75981-288.18		BUCHSENPLATTE, PJ-50	VIDEO/AUDIO OUT, PJ-50
0039.000	1	75981-288.19		FOCUS SCHALTERPLATTE, FL-53	PUSH FOCUS HOLD SWITCH, FL-53
0040.000	1	75981-288.08		GEHAEUSEVORDERTEIL	CABINET FRONT
0042.000	1	75981-288.22		FLEXIBLE LEITUNG / W 570	FLEXIBLE CABLE / W 570
0043.000	1	75981-288.23		FLEXIBLE LEITUNG / W 573	FLEXIBLE CABLE / W 573
0044.000	1	75981-288.20		FELXIBLE LEITUNG / W 400	FLEXIBLE CABLE / W 400
0045.000	1	75981-288.21		FLEXIBLE LEITUNG / W 410	FLEXIBLE CABLE / W 410
0051.000	2	75981-288.03		GEHAEUSETEIL (R) MONITOR	HOUSING PART (R) MONITOR
0052.000	2	75981-282.38		SUCHERLINSE	VIEW FINDER LENS
0053.000	2	75981-282.39		HALTER, CRT	HOLDER, CRT
0054.000	2	75981-282.40		HALTER	HOLDER
0055.000	2	75981-288.24		EIN-/AUSSCHALTER PLATTE, PK-35	CAMERA/PLAYER SWITCH, PK-35P
0056.000	2	75981-282.42		ABDECKUNG	COVER
0057.000	2	75987-526.93		ABLENKEINHEIT	DEFLECTION UNIT
0058.000	2	75981-282.43		MONITORPLATTE, VF-44P	MONITOR PANEL
0060.000	2	75981-288.02		GEHAEUSETEIL, MONITOR LI.	HOUSING PART, MONITOR LI.
0061.000	2	75987-560.67		SCHRAUBE M2X8	SCREW M2X8
0062.000	2	75981-282.45		OKULAR	OCULAR
0063.000	2	75981-282.46		AUGENMUSCHEL	EYE CAP
0064.000	2	75987-560.60		SCHRAUBE M2	SCREW M2
0066.000	2	75981-288.07		GEHAEUSETEIL, RECHTS	HOUSING PART, RIGHT
0068.000	2	75981-288.12		BUCHSENABDECKUNG	SOCKET COVER
0069.000	2	75981-288.01		TASTE, BATTERIE	KEY, BATTERY
0070.000	2	75981-282.49		KNOPF, EIN/AUS	KNOB, ON/OFF
0071.000	2	75981-282.50		TASTE	KEY
0074.000	2	75981-282.52		VERRIEGELUNG F. BATTERIE	LOCKING F. BATTERY
0077.000	2	75981-283.94		TASTE	KEY
0078.000	2	75987-560.17		DRUCKFEDER	PRESSURE SPRING
0079.000	2	75981-282.54		HALTER	HOLDER
0080.000	2	75981-288.25		BEDIENPLATTE ZÄHLWERK, DK-24	RESET SWITCH, DK-24

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG (D)	DESCRIPTION (GB)
0087.000	2	75981-288.26		BEDIENTEILPLATTE, CAMERA CK-61	CAMERA CONTROL SWITCH, CK-61
0095.000	2	75981-282.58		SUCHER-MONITOR-ROEHRE V901	VIEW FINDER MINITOR PIC.TUBE V901
0096.000	2	75981-288.27		FLEXIBLE LEITUNG / W 561	FLEXIBLE CABLE / W 561
0097.000	2	75981-288.28		FLEXIBLE LEITUNG / W 564	FLEXIBLE CABLE / W 564
0102.000	3	75981-288.29		NETZTEILPLATTE, PS-308	POWER REG./MECH DRIVE, PS-308
0104.000	3	75981-288.04		CASSETTENFACHDECKEL	CASSETTE COMPARTMENT LID
0105.000	3	75981-282.62		TASTENWIPPE	PUSHWEEP
0107.000	3	75981-282.63		FLEXIBLE LEITUNG, FP-558	FLEXIBLE CABLE, FP-558
0108.000	3	75987-560.60		SCHRAUBE M2	SCREW M2
0110.000	3	75987-560.47		PLATTE	PLATE
0114.000	3	75981-288.30		MOTORSTEUERPL.KOPFRAD, SL-28	MECH CONTROL, SL-28
0116.000	3	75981-282.65		FLEXIBLE PLATTE	FLEXIBLE PLATE
0117.000	3	75981-282.66		STECKERLEISTE	MULTIPOINT CONNECTOR
0118.000	3	75981-288.31		ABLAUFSTEUERUNG CAMERAPLATTE CS -37	CAMERA,REC/PB AMP, SERVO/SYSTEM CONTROL, CS-37
0125.000	3	75981-288.32		VIDEO/AUDIO PLATTE, VA-77	VIDEO/AUDIO (MONO), VA-77P
0129.000	3	75981-288.33		CCD-PLATTE, CD-96	CCD-DRIVE, CD-96
0132.000	3	75981-282.71		IR-FILTER	IR-HOLDER
0133.000	3	75981-283.33		OPTIK KPL. (TYPE I)	OPTIC CPL. (TAPE I)
0134.000	3	75981-282.72		HALTER	HOLDER
0136.000	3	75981-282.70		HALTER, STATIV	HOLDER, STATIV
0140.000	3	75981-288.34		CCD-EINHEIT, IC 901	CCD-UNIT, IC 901
0143.000	3	75981-282.74		FLEXIBLE PLATTE, FP-600 / W 500	FLEXIBLE PLATE, FP-600 / W 500
0145.000	3	75981-282.75		FLEXIBLE PLATTE, FP-437 / W 501	FLEXIBLE PLATE, FP-437 / W 501
0151.000	4	75981-282.76		CASSETTENSCHACHT	CASSETTE COMPARTMENT
0153.000	4	75981-282.77		SCHENKELFEDER	LEG SPRING
0154.000	4	75981-282.78		DAEMPFUNG	DAMPING OR ATTENUATION
0155.000	4	75987-527.43		SCHEIBE	WASHER
0157.000	4	75981-282.79		KOPFREINIGER KPL.	HEAD CLEANER CPL.
0158.000	4	75981-282.81		ZUGFEDER	TENSION SPRING
0159.000	4	75987-527.48		SCHEIBE	WASHER
0160.000	4	75981-282.82		KOPFREINIGERBUERSTE	HEAD CLEANER BRUSH
0161.000	4	75981-282.83		PLATTE	PLATE
0201.000	5	75981-282.84		WICKELTELLER	SPOOL CARRIER
0203.000	5	75981-282.85		ANDRUCKROLLE	PINCH ROLLER
0206.000	5	75981-282.86		UMLENKROLLE	PIVOTING ROLLER
0209.000	5	75981-282.87		HEBEL	LEVER
0210.000	5	75987-527.44		SCHEIBE	WASHER
0211.000	5	75981-282.88		ZAHNRAD	GEAR WHEEL
0212.000	5	75981-282.89		HEBEL	LEVER
0213.000	5	75987-552.84		SCHEIBE	WASHER
0214.000	5	75981-282.90		ZAHNRAD	GEAR WHEEL
0216.000	5	75981-282.91		RIEGEL	LATCH,BOLT
0217.000	5	75981-282.92		WICKELTELLER	SPOOL CARRIER
0219.000	5	75981-282.93		SCHNUR	CORD
0220.000	5	75981-282.94		BREMSHEBEL	BRAKE LEVER
0221.000	5	75981-282.95		ZUGFEDER	TENSION SPRING
0222.000	5	75981-282.96		UMLENKBOLZEN	THREADUBG BOLT
0223.000	5	75981-282.97		SCHENKELFEDER	LEG SPRING
0224.000	5	75981-282.98		BREMSHEBEL	BRAKE LEVER
0226.000	5	75981-282.99		CHASSIS KPL. LS	CHASSIS CPL. LS
0227.000	5	75981-283.00		FUEHRUNG	GUIDE
0228.000	5	75981-283.01		UMLENKROLLE	PIVOTING ROLLER
0230.000	5	75981-283.02		HEBEL KPL.	LEVER CPL.
0231.000	5	75981-283.03		SCHIEBER	SLIDE
0234.000	5	75981-283.04		SCHALTER / S 002	SWITCH / S 002
0250.000	6	75981-283.12		BANDTROMMEL KPL.	TAPE DRUM
0251.000	6	75981-283.05		KOPFRAD	HEAD WHEEL
0252.000	6	75981-283.06		BLATTFEDER	LEAF SPRING
0253.000	6	75981-283.07		UMLENKHEBEL, TG7	PIVOTING LEVER, TG 7
0256.000	6	75981-283.08		HEBEL	LEVER
0258.000	6	75987-561.01		SCHRAUBE	SCREW
0259.000	6	75981-283.09		HEBEL	LEVER
0261.000	6	75981-283.10		BANDFUEHRUNGSBOLZEN	TAPE GUIDE PIN
0262.000	6	75981-283.11		DRUCKFEDER	PRESSURE SPRING
0266.000	6	75981-283.13		CAPSTAN-MOTOR / M 902	CAPSTAN MOTOR / M 902
0267.000	6	75981-283.14		FAEDELMOTOR / M 903	LOADING MOTOR / M 903
0301.000	7	75981-283.15		HEBEL	LEVER

POS. NR. POS. NO.	ABB. NR. FIG. NO.	SACHNUMMER PART NUMBER	ANZ. QUA.	BEZEICHNUNG (D)	DESCRIPTION (GB)
0302.000	7	75987-562.48		SCHRAUBE	SCREW
0303.000	7	75981-283.16		HEBEL	LEVER
0304.000	7	75987-552.84	4	SCHEIBE	WASHER
0306.000	7	75981-283.17		HEBEL	LEVER
0307.000	7	75981-283.18		DRUCKFEDER	PRESSURE SPRING
0308.000	7	75981-283.19		ANTRIEBSRAD	DRIVE WHEEL
0309.000	7	75981-283.20		ANTRIEBSRIEMEN	DRIVE BELT
0310.000	7	75981-283.21		RIEMENSCHEIBE	BELT PULLEY
0311.000	7	75981-283.22		SCHIEBER	SLIDE
0312.000	7	75981-283.23		KURVENRAD	CURVED WHEEL
0313.000	7	75981-283.24		HEBEL	LEVER
0315.000	7	75981-283.25		GRUNDSCHASSIS	MAIN CHASSIS
0317.000	7	75981-283.26		HEBEL	LEVER
0318.000	7	75981-283.27		HEBEL	LEVER
0319.000	7	75981-283.28		ZAHNRAD	GEAR WHEEL
0320.000	7	75981-283.29		ZAHNRAD	GEAR WHEEL
0321.000	7	75981-283.30		FLEXIBLE PLATTE, FP-444	FLEXIBLE PLATE, FP-444
0325.000	7	75981-283.31		SCHALTER	SWITCH
0326.000	7	75981-283.32		SCHALTER	SWITCH
0327.000	7	75981-283.97		FLEXIBLE LEITUNG, FP-442	FLEXIBLE CABLE, FP-442
				* UNTERSCHEIDUNGSMERKMAL DER BEIDEN TYPEN IST DER ERSTE BUCHSTABE IN DER SERIENNUMMER AM VORDEREN ENDE DER OPTIK: GROSSBUCHSTABE: "T" FÜR TYP I (VCL-6110 WB) "I" FÜR TYP III (VCL-6110 WE)	* DISTINGUISHING TYPE I (VCL-6110WB) FROM TYPE III (VCL-6110WE) THE FIRST LETTER OF SERIAL NUMBERS SHOWN IN A SERIAL NUMBER LABEL ATTACHED TO THE FRONT OF THE LENS PORTION BEGINS W. CAPITAL LETTER "T" FOR TYPE I (VCL-6110 WB) AND "I" FOR TYPE III (VCL-6110 WE)
0351.000	8	75981-283.33		* OPTIK KPL. (TYPE I)	* OPTIC CPL. (TYPE I)
0351.001	8	75981-283.34		LINSEN-EINHEIT (TYPE I)	LENS UNIT (TYPE I)
0351.002	8	75981-283.35		SENSOR, RESET (TYPE I)	SENSOR RESET (TYPE I)
0351.003	8	75981-283.36		FLEXIBLE LEITUNG (TYPE I)	FLEXIBLE CABLE (TYPE I)
0351.004	8	75981-283.37		SENSOR, ZOOM (TYPE I)	SENSOR, ZOOM (TYPE I)
0351.005	8	75981-283.42		IRIS-MOTOR (TYPE I) M 904	IRIS-MOTOR (TYPE I M 904
0351.006	8	75981-283.44		MOTOR-FOCUS (TYPE I) M 905	MOTOR-FOCUS (TYPE I) M 905
0351.007	8	75981-283.46		MOTOR-ZOOM (TYPE I) M 906	MOTOR-ZOOM (TYPE I) M 906
0361.000	8	75981-288.35		* OPTIK KPL. TYP III KPL.	* OPTIC CPL. TYP III CPL.
				ZUBEHOER	**ACCESSORIES**
		75987-553.10		NETZTEIL NA 8-1	POWER SUPPLY NA 8-1
		75987-527.90		ACCU BP 8-1	ACCU BP 8-1
		75987-553.11		MODULATOR M 81	MODULATOR M8 1
		75987-527.93		SCHULTERRIEMEN SH 8	SHOULDER BELT SH 8
		72010-511.80		BEDIENUNGSANL. GB	INSTRUCTION MANUAL GB
		72010-511.81		BEDIENUNGSANL. F / D / E	INSTRUCTION MANUAL F / D / E
		72010-511.82		BEDIENUNGSANL. NL / S / I	INSTRUCTION MANUAL NL / S / I
		72010-511.90		SERVICE MANUAL	SERVICE MANUAL

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
	75981-288.33	**CCD-PLATTE, CD-96**
D 901	75981-273.15	DIODE 1 SS 181
D 903	75981-273.15	DIODE 1 SS 181
D 904	75987-525.86	DIODE 1 SS 226
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L 901	75987-525.52	SPULE 100UH
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Q 901	75987-521.21	TRANS.2 SC 4154
Q 902	75987-459.42	TRANS.XN 1501
Q 903	75981-273.18	TRANS.2 SK 1875 BL/VTE 85
	75981-288.26	**BEDIENTEILPLATTE CAMERA CK-61**
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D 560	75981-273.15	DIODE 1 SS 181
D 561	75987-458.27	DIODE MA 110
D 562	75987-458.27	DIODE MA 110
D 563	75981-283.75	DIODE RD 7,5 ES-B2
D 564	75981-283.75	DIODE RD 7,5 ES-B2
D 565	75981-283.75	DIODE RD 7,5 ES-B2
D 566	75981-283.75	DIODE RD 7,5 ES-B2
D 567	75981-283.75	DIODE RD 7,5 ES-B2
D 568	75981-283.75	DIODE RD 7,5 ES-B2
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L 560	75981-273.21	CHIP-SPULE 4.7UH
—/ —		
S 560	75981-288.39	SCHALTER
S 564	75981-283.49	SCHALTER
S 565	75981-283.49	SCHALTER
S 566	75981-283.49	SCHALTER
S 567	75981-283.69	SCHALTER
S 568	75981-283.69	SCHALTER
	75981-288.31	**ABLAUFSTEUERUNG CAMERA PLATTE, CS-37**
—▶|—		
D 501	75987-458.42	DIODE MA 728
D 502	75987-458.27	DIODE MA 110
D 503	75981-283.75	DIODE RD 7,5 ES-B2
D 504	75987-462.20	DIODE DAN 202 U
D 505	75981-283.75	DIODE RD 7,5 ES-B2
D 506	75981-283.75	DIODE RD 7,5 ES-B2
D 507	75987-458.27	DIODE MA 110
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FL 701	75981-283.50	FILTER
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IC 001	75987-526.26	IC CXA 1202 R
IC 501	75981-283.51	IC TB 1206 F
IC 502	75987-560.11	IC TL 1596 CDB
IC 503	75981-283.52	IC CXP 80624-410 Q
IC 505	75987-563.33	IC CXA 8006 M
IC 506	75981-288.36	IC UPD 75316 GF-303-389
IC 507	75987-581.17	IC CXA 1448 N
IC 508	75981-273.86	IC S 81350 HG-KD
IC 509	75987-559.95	IC UPD 7564 G 540
IC 510	75981-283.54	IC MPC 1720 M
IC 511	75981-274.76	IC AK 6420 F ROM
IC 701	75981-283.55	IC SC 7 SU 04 F
IC 702	75987-581.53	IC M 62352 GP
IC 703	75981-283.56	IC UPD 6456 GS 618
IC 704	75981-273.78	IC CXD 2101 AR
IC 705	75981-283.57	IC CXD 2103 AR-T 6
IC 706	75981-273.77	IC CXD 2104 N
IC 707	75981-284.70	IC CXD 2100 AQ
IC 709	75981-283.58	IC CXP 80624-299 Q
IC 712	75981-274.76	IC AK 6420 F ROM
IC 801	75981-283.59	IC CXD 1257 AR-T 5
IC 802	75981-283.60	IC CXA 1507 BR
IC 803	75981-273.71	IC CXA 1399Q
IC 804	75981-273.74	IC CXD 1250 N
IC 805	75981-273.73	IC CXA 1390 AR
IC 851	75987-521.02	IC NJM 3414 M
IC 852	75987-560.09	IC LM 324 D
IC 853	75981-273.82	IC MPC 1724 MR
IC 854	75981-273.96	IC LB 1830 M
IC 855	75987-560.10	IC LM 358 D
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L 001	75987-525.53	SPULE 220UH
L 002	75987-525.53	SPULE 220UH
L 003	75987-525.53	SPULE 220UH
L 004	75987-525.50	SPULE 10UH
L 041	75987-525.53	SPULE 220UH
L 042	75987-525.32	SPULE 10UH
L 501	75987-525.50	SPULE 10UH
L 502	75987-525.50	SPULE 10UH
L 503	75981-273.21	CHIP-SPULE 4.7UH
L 504	75981-273.21	CHIP-SPULE 4.7UH
L 506	75987-525.50	SPULE 10UH
L 703	75981-273.38	CHIP-SPULE 10UH
L 704	75981-273.38	CHIP-SPULE 10UH
L 705	75981-283.63	CHIP-SPULE 1UH
L 706	75987-525.50	SPULE 10UH
L 714	75981-283.62	CHIP-SPULE 27UH
L 715	75987-525.50	SPULE 10UH
L 716	75987-525.49	SPULE 1 UH
L 717	75987-525.50	SPULE 10UH
L 719	75981-273.38	CHIP-SPULE 10UH
L 722	75981-273.38	CHIP-SPULE 10UH
L 723	75987-525.41	SPULE 68UH
L 730	75987-525.49	SPULE 1 UH
L 731	75987-525.49	SPULE 1 UH
L 732	75987-525.49	SPULE 1 UH
L 733	75981-273.44	SPULE 1UH
L 734	75981-273.44	SPULE 1UH
L 801	75987-525.50	SPULE 10UH
L 802	75981-273.38	CHIP-SPULE 10UH
L 803	75987-525.50	SPULE 10UH
L 804	75987-525.50	SPULE 10UH
L 851	75987-525.50	SPULE 10UH
L 852	75981-283.63	CHIP-SPULE 1UH
L 853	75987-525.50	SPULE 10UH
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PS 501 ⚠	75981-273.47	SICHERUNG
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Q 001	75987-528.81	TRANS.XN 4312
Q 002	75987-553.45	TRANS.2 SC 1623
Q 003	75987-526.16	TRANS.DTA 144 EU

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
Q 041	75987-434.50	TRANS.2 SA 1576 QR
Q 043	75987-526.03	TRANS.2 SA 1162
Q 501	75987-533.14	TRANS.DTC 114 EU
Q 502	75987-512.79	TRANS.XN 6401
Q 503	75987-553.45	TRANS.2 SC 1623
Q 507	75987-526.16	TRANS.DTA 144 EU
Q 509	75987-536.25	TRANS.2 SB 1202 FAST-TL
Q 510	75987-480.69	TRANS.-WIDERST.XN 4501
Q 511	75987-480.69	TRANS.-WIDERST.XN 4501
Q 702	75987-459.43	TRANS.XN 4601
Q 703	75981-283.65	TRANS.MSA 1586-BC
Q 704	75981-283.65	TRANS.MSA 1586-BC
Q 707	75981-283.64	TRANS.MSC 4116-B/C
Q 708	75981-271.95	TRANS.DTA 114 EU
Q 709	75987-526.21	TRANS.DTC 124 EU
Q 801	75981-288.37	TRANS.2 SC 3931 C
Q 802	75987-480.68	TRANS.-WIDERST.XN 4401
Q 851	75981-283.64	TRANS.MSC 4116-B/C
Q 853	75987-480.68	TRANS.-WIDERST.XN 4401
R 600	75987-585.62	WIDERST.100OHM 5% 1/16W
T 801	75987-559.14	TRIMMER
X 501	75981-273.49	QUARZ
X 502	75981-283.66	QUARZ 32 KHZ
X 503	75987-559.61	QUARZ (4,19 MHZ)
X 504	75981-283.67	QUARZ 700 KHZ
X 701	75981-283.68	QUARZ 10 MHZ
X 801	75987-581.07	QUARZ 28.375 MHZ
	75981-288.25	**BEDIENPLATTE ZÄHLWERK DK-24**
D 569	75981-283.75	DIODE RD 7,5 ES-B2
D 571	75981-283.75	DIODE RD 7,5 ES-B2
S 561	75981-283.49	SCHALTER
S 562	75981-283.49	SCHALTER
S 563	75981-283.49	SCHALTER
	75981-288.19	**FOCUS SCHALTERPLATTE FL-53**
S 400	75981-283.69	SCHALTER
	75981-288.14	**MIKROFONVERSTÄRKER MA-155**
	75987-536.06	BUCHSE / J 400
D 400	75981-283.75	DIODE RD 7,5 ES-B2
D 401	75981-283.75	DIODE RD 7,5 ES-B2

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
IC 400	75987-553.58	IC LA 7293 M-TE-L
L 400	75981-283.63	CHIP-SPULE 1UH
L 401	75981-283.63	CHIP-SPULE 1UH
Q 400	75987-434.50	TRANS.2 SA 1576 QR
	75981-288.18	**BUCHSENPLATTE, PJ-50**
	75981-283.74	BUZZER,PIEZOELECTRIC BU550
D 550	75987-458.27	DIODE MA 110
D 551	75981-283.75	DIODE RD 7,5 ES-B2
D 552	75981-283.75	DIODE RD 7,5 ES-B2
D 553	75981-283.75	DIODE RD 7,5 ES-B2
D 554	75981-283.75	DIODE RD 7,5 ES-B2
S 550	75987-581.18	SCHALTER
	75981-288.24	**EIN-/AUSSCHALTER PLATTE PK-35**
D 540	75981-273.15	DIODE 1 SS 181
S 540	75987-559.54	SCHALTER (POWER)
S 541	75987-581.18	SCHALTER
	75981-288.29	**NETZTEILPLATTE, PS-308**
	75987-581.31	BUCHSE / J 951
	75987-536.06	BUCHSE / J 952
D 950	75981-271.70	DIODE FC 806
D 952	75981-283.75	DIODE RD 7,5 ES-B2
D 953	75981-283.75	DIODE RD 7,5 ES-B2
D 961	75987-458.27	DIODE MA 110
D 962	75981-283.75	DIODE RD 7,5 ES-B2
D 963	75981-283.75	DIODE RD 7,5 ES-B2
D 964	75987-458.27	DIODE MA 110
IC 950	75981-283.76	IC MB 3785 APFV-G-BND-ER
L 950	75981-271.73	SPULE 1,0UH
L 951	75981-271.73	SPULE 1,0UH
L 952	75981-271.73	SPULE 1,0UH
L 953	75981-271.73	SPULE 1,0UH

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
L 954	75981-273.22	SPULE 10UH
L 955	75981-273.22	SPULE 10UH
L 956	75981-273.22	SPULE 10UH
L 957	75981-273.20	SPULE 47UH
L 958	75981-283.78	CHIP-SPULE 330UH
L 959	75981-283.78	CHIP-SPULE 330UH
L 960	75987-559.34	CHIP SPULE 2.2UH
L 961	75987-525.50	SPULE 10UH
L 962	75987-525.50	SPULE 10UH
L 963	75981-273.21	CHIP-SPULE 4.7UH
L 964	75981-273.20	SPULE 47UH
L 965	75981-273.20	SPULE 47UH
L 966	75987-528.72	CHIP SPULE 1UH
L 967	75987-528.72	CHIP SPULE 1UH
L 968	75981-273.44	SPULE 1UH
L 972	75981-273.44	SPULE 1UH
L 974	75981-273.44	SPULE 1UH
PS 950 ⚠	75987-525.61	SICHERUNG PRF1600
PS 951 ⚠	75987-525.61	SICHERUNG PRF1600
Q 950	75981-271.76	TRANS.FC 149
Q 951	75987-573.81	TRANS.2 SB 1122-S
Q 952	75981-273.27	TRANS.FP 102
Q 953	75981-273.24	TRANS.FP 101
Q 954	75981-273.24	TRANS.FP 101
Q 955	75987-526.16	TRANS.DTA 144 EU
Q 957	75981-283.79	TRANS.2 SJ 179
Q 958	75987-534.36	TRANS.IMH 2
Q 959	75981-283.79	TRANS.2 SJ 179
Q 960	75987-480.69	TRANS.-WIDERST.XN 4501
T 950	75981-283.80	TRANSFORMER
X 950	75981-283.81	QUARZ 475 KHZ
	75981-288.30	**MOTORSTEUERPLATTE KOPFRAD, SL-28**
D 511	75981-283.75	DIODE RD 7,5 ES-B2
IC 501	75981-283.82	IC LB 8111 V
L 501	75987-525.49	SPULE 1 UH
Q 501	75987-480.69	TRANS.-WIDERST.XN 4501
	75981-282.28	**BEDIENPLATTE, START/STOP**
S 580	75981-283.69	SCHALTER
S 581	75987-581.18	SCHALTER

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
	75981-288.32	**VIDEO/AUDIO PLATTE, VA-77**
	75987-581.44	THERMISTOR TH 101
CF 301	75981-273.51	FILTER
D 102	75987-525.86	DIODE 1 SS 226
D 201	75987-462.20	DIODE DAN 202 U
D 202	75987-462.20	DIODE DAN 202 U
D 203	75987-462.21	DIODE DAP 202 U
D 205	75987-462.20	DIODE DAN 202 U
D 206	75987-462.20	DIODE DAN 202 U
D 301	75987-525.88	DIODE DWA 010
D 361	75987-462.20	DIODE DAN 202 U
D 362	75987-462.20	DIODE DAN 202 U
D 401	75987-525.84	DIODE RD 2.7 M-B2
FL 051	75987-559.23	FILTER
FL 053	75987-581.48	FILTER, LOW PASS
FL 054	75987-581.49	FILTER
FL 201	75981-273.37	FILTER, REC.Y
FL 301	75987-559.24	FILTER
FL 302	75987-525.12	FILTER 4.43MHZ
FL 361	75987-559.25	FILTER
FL 502	75987-581.36	FILTER
IC 051	75987-559.85	IC CXL 1506 M
IC 052	75987-533.30	IC NJM 2235 M
IC 053	75981-273.81	IC SC 7 S 04 F
IC 054	75981-273.70	IC CXA 1211 M
IC 201	75987-559.81	IC CXA 1207 R
IC 202	75987-533.30	IC NJM 2235 M
IC 203	75981-288.40	IC M 62353 GP
IC 204	75981-288.40	IC M 62353 GP
IC 205	75981-273.93	IC CXA 1452N
IC 206	75981-273.70	IC CXA 1211 M
IC 301	75987-559.82	IC CXA 1208 R
IC 361	75987-526.45	IC CXA 1203 N
IC 400	75987-548.94	IC TC 4 S 66 FTE 85L
IC 401	75981-288.38	IC CXA 1535 R
L 051	75987-525.49	SPULE 1 UH
L 052	75987-525.51	SPULE 47UH
L 053	75987-525.50	SPULE 10UH
L 054	75987-525.46	SPULE 150UH
L 090	75987-525.46	SPULE 150UH
L 101	75987-525.50	SPULE 10UH
L 102	75987-525.36	SPULE 22UH
L 103	75987-581.41	SPULE 330UH
L 104	75987-525.25	SPULE 820UH
L 105	75987-525.47	SPULE 180UH
L 109	75987-525.47	SPULE 180UH
L 110	75987-525.37	SPULE 33UH
L 113	75987-525.32	SPULE 10UH
L 114	75987-525.31	SPULE 8.2UH
L 115	75987-581.41	SPULE 330UH
L 116	75987-535.98	CHIP SPULE 120 UH
L 117	75987-521.31	CHIP SPULE 220UH
L 202	75987-525.51	SPULE 47UH
L 203	75987-525.50	SPULE 10UH

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
L 204	75987-525.43	SPULE 100UH
L 205	75987-581.43	CHIP SPULE 3.3 UH
L 206	75987-525.30	SPULE 6,8 UH
L 207	75987-525.40	SPULE 56UH
L 209	75987-521.31	CHIP SPULE 220UH
L 210	75987-581.42	CHIP SPULE 1.2 UH
L 211	75987-525.40	SPULE 56UH
L 212	75987-581.42	CHIP SPULE 1.2 UH
L 213	75987-533.39	CHIP SPULE 27 UH
L 302	75987-533.39	CHIP SPULE 27 UH
L 303	75987-525.43	SPULE 100UH
L 304	75987-525.30	SPULE 6,8 UH
L 305	75987-525.43	SPULE 100UH
L 306	75987-535.98	CHIP SPULE 120 UH
L 307	75987-525.46	SPULE 150UH
L 308	75987-525.43	SPULE 100UH
L 990	75987-525.49	SPULE 1 UH
Q 051	75987-534.36	TRANS.IMH 2
Q 052	75987-528.74	TRANS.2 SB 624 BV 4
Q 053	75987-434.50	TRANS.2 SA 1576 QR
Q 054	75987-434.50	TRANS.2 SA 1576 QR
Q 055	75987-553.45	TRANS.2 SC 1623
Q 056	75987-553.45	TRANS.2 SC 1623
Q 057	75987-553.45	TRANS.2 SC 1623
Q 060	75987-553.45	TRANS.2 SC 1623
Q 061	75987-553.45	TRANS.2 SC 1623
Q 063	75987-459.48	TRANS.-WIDERST.XN 4215
Q 064	75987-553.45	TRANS.2 SC 1623
Q 065	75987-553.45	TRANS.2 SC 1623
Q 066	75987-434.50	TRANS.2 SA 1576 QR
Q 067	75987-533.41	TRANS.DTA 114 TU
Q 103	75987-553.45	TRANS.2 SC 1623
Q 104	75987-553.45	TRANS.2 SC 1623
Q 110	75981-271.95	TRANS.DTA 114 EU
Q 111	75987-525.94	TRANS.2 SC 2223 F 13
Q 114	75987-553.45	TRANS.2 SC 1623
Q 118	75987-534.36	TRANS.IMH 2
Q 119	75987-434.50	TRANS.2 SA 1576 QR
Q 120	75987-525.94	TRANS.2 SC 2223 F 13
Q 121	75987-434.50	TRANS.2 SA 1576 QR
Q 122	75987-553.45	TRANS.2 SC 1623
Q 202	75987-434.50	TRANS.2 SA 1576 QR
Q 204	75987-553.45	TRANS.2 SC 1623
Q 207	75987-526.16	TRANS.DTA 144 EU
Q 212	75987-534.36	TRANS.IMH 2
Q 213	75987-526.18	TRANS.DTC 144 EU
Q 214	75987-534.29	TRANS.2 SB 1132Q /2SB1115
Q 215	75987-553.45	TRANS.2 SC 1623
Q 216	75987-553.45	TRANS.2 SC 1623
Q 217	75987-526.16	TRANS.DTA 144 EU
Q 218	75987-480.69	TRANS.-WIDERST.XN 4501
Q 220	75987-553.45	TRANS.2 SC 1623
Q 222	75987-480.69	TRANS.-WIDERST.XN 4501
Q 223	75987-526.16	TRANS.DTA 144 EU
Q 224	75987-526.18	TRANS.DTC 144 EU
Q 225	75987-526.18	TRANS.DTC 144 EU
Q 227	75987-526.18	TRANS.DTC 144 EU
Q 228	75987-553.45	TRANS.2 SC 1623
Q 229	75987-553.45	TRANS.2 SC 1623
Q 230	75987-434.50	TRANS.2 SA 1576 QR
Q 231	75981-271.97	TRANS.IMT 2
Q 232	75987-434.50	TRANS.2 SA 1576 QR
Q 233	75981-271.97	TRANS.IMT 2
Q 234	75987-526.18	TRANS.DTC 144 EU
Q 235	75987-434.50	TRANS.2 SA 1576 QR
Q 302	75987-480.69	TRANS.-WIDERST.XN 4501
Q 304	75987-526.16	TRANS.DTA 144 EU

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG (D) DESCRIPTION (GB)
Q 306	75987-553.45	TRANS.2 SC 1623
Q 307	75987-553.45	TRANS.2 SC 1623
Q 308	75987-434.50	TRANS.2 SA 1576 QR
Q 309	75987-553.45	TRANS.2 SC 1623
Q 310	75987-526.18	TRANS.DTC 144 EU
Q 311	75987-434.50	TRANS.2 SA 1576 QR
Q 312	75987-528.81	TRANS.XN 4312
Q 313	75987-526.16	TRANS.DTA 144 EU
Q 314	75987-553.45	TRANS.2 SC 1623
Q 315	75987-526.16	TRANS.DTA 144 EU
Q 316	75987-534.36	TRANS.IMH 2
Q 317	75987-528.81	TRANS.XN 4312
Q 318	75987-526.18	TRANS.DTC 144 EU
Q 319	75987-526.18	TRANS.DTC 144 EU
Q 361	75987-525.94	TRANS.2 SC 2223 F 13
Q 362	75987-526.18	TRANS.DTC 144 EU
Q 363	75987-553.45	TRANS.2 SC 1623
Q 364	75987-526.16	TRANS.DTA 144 EU
Q 365	75987-553.45	TRANS.2 SC 1623
Q 366	75987-526.18	TRANS.DTC 144 EU
Q 367	75987-526.18	TRANS.DTC 144 EU
Q 368	75987-526.16	TRANS.DTA 144 EU
Q 401	75987-521.50	TRANS.DTC 144 TU
Q 402	75987-526.18	TRANS.DTC 144 EU
Q 990	75987-534.29	TRANS.2 SB 1132Q /2SB1115
Q 991	75987-553.45	TRANS.2 SC 1623
R 385	75987-585.74	WIDERST.0 5% 1/8W
RV 051	75987-535.86	ESTR.1 KOHM
X 301	75987-526.54	KRISTALL 4.43MHZ
	75981-282.43	**MONITORPLATTE, VF-44**
	75981-273.54	THERMISTOR TH 501
C 504	75987-553.13	CHIP KONDENS.0,001MF
C 505	75981-283.85	CHIP-KONDENS.0,0033UF 10%
C 506	75981-283.86	CHIP-KONDENS.0,0082UF 10%
D 501	75987-512.83	LE DIODE LN 1261 C
D 502	75987-512.83	LE DIODE LN 1261 C
D 503	75987-356.22	DIODE MA 152 WA (M0)
IC 501	75987-526.44	IC AN 2512 S
L 501	75987-525.51	SPULE 47UH
L 502	75987-525.36	SPULE 22UH
L 503	75981-283.87	SPULE
Q 501	75987-526.04	TRANS.2 SA 1163 L
Q 503	75987-536.19	TRANS.2 SD 1615 A-GP

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG D DESCRIPTION GB
RV 501	75987-535.87	ESTR.2.2 KOHM
WW.	75987-559.27	ESTR.2.2 KOHM
RV 502	75981-283.88	ESTR. 4,7MOHM
RV 503	75981-283.89	ESTR. 1MOHM
RV 504	75987-535.90	ESTR.47 KOHM
WW.	75987-559.29	ESTR.47 KOHM
RV 505	75987-535.85	ESTR.470 OHM
WW.	75981-273.35	ESTR.470 OHM
S 502	75981-283.90	SCHALTER
T 501	75981-283.91	TRANSFORMER
	75981-288.16	**BEDIENTEILPLATTE RECORDER VK-28**
D 570	75981-273.15	DIODE 1 SS 181
S 570	75981-283.92	SCHALTER
S 571	75981-283.93	SCHALTER
S 572	75981-283.93	SCHALTER
S 573	75981-283.93	SCHALTER
S 574	75981-283.93	SCHALTER
S 576	75981-283.93	SCHALTER

POS. NR. POS. NO.	SACHNUMMER PART NUMBER	BEZEICHNUNG D DESCRIPTION GB

CCD-FX300E

SERVICE MANUAL

AEP Model
UK Model
E Model
Australian Model

SONY
Video8
Handycam
10×
AE

Video8
Handycam

A MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL IV" (9-973-199-11).

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 2.0051 cm/sec. LP mode: Approx. 1.0058 cm/sec.
Recording/Playback time	SP mode: 1 hour 30 min. (P5-90) LP mode: 3 hours (P5-90)
Fast forward/rewind time	Approx. 6 min. 30 sec. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 10 × power zoom lens f=6.1 to 61 mm ($^{1}/_{4}$ to $2^{1}/_{2}$ inches) Approx. 44 to 440 mm ($1^{3}/_{4}$ to $17^{3}/_{8}$ inches) converted into the focal length of a 35 mm still camera. F 1.6 with macro Filter diameter: 37 mm ($1^{1}/_{2}$ inches) TTL autofocus system inner focus wide macro system
Colour temperature	AUTO
Minimum illumination	3 lx
Illumination range	3 lx to 100,000 lx (0.3 to 9294 footcandles)
Recommended illumination	More than 100 lx (9 footcandles)
Aperture correction	Automatic With backlight adjustment

Input and output connectors

Video output	Phono jack 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack −7.5 dBs, (at load impedance 47 kilohms) impedance less than 1 kilohm
RFU DC OUT	Special minijack, 5 V DC
Earphone jack	Minijack, 8-ohm impedance
Remote Ⓛ jack	Stereo mini-minijack
MIC jack	Minijack, −66 dBs, low impedance with 2.5 to 3 V DC output, impedance 6.8 kilohms
Microphone power output jack	Special minijack, 5 V DC

— Continued on next page —

MICROFILM

8 VIDEO CAMERA RECORDER

SONY®

General

Power requirements	On battery mounting surface 6.0 V (battery pack) 7.5 V (AC power adaptor)
Power consumption	5.7 W (camera recording) including the viewfinder
Installation	Vertically, horizontally
Operating temperature	0°C to 40°C (32°F to 104°F)
Storage temperature	–20°C to +60°C (–4°F to +140°F)
Dimensions	Approx. 118 x 108 x 265 mm (w/h/d) ($4\frac{3}{4} \times 4\frac{3}{8} \times 10\frac{1}{2}$ in.)
Mass	Approx. 820 g (1 lb 12 oz) excluding the battery pack, lithium battery, cassette, lens cap, jack cover and shoulder strap Approx. 1012 g (2 lb 3 oz) including the battery pack NP-55, lithium battery CR2025, cassette P5-90, lens cap, jack cover and shoulder strap
Microphone	Electret condenser microphone, uni-directional, monaural type

Design and specifications are subject to change without notice.

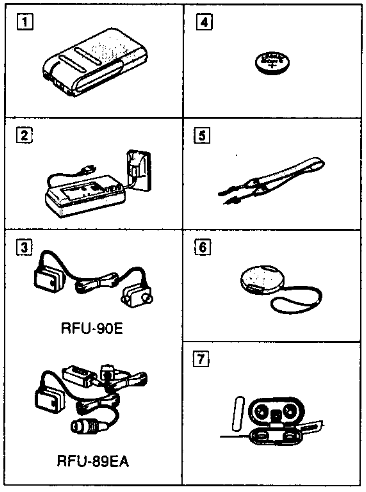
Supplied Accessories

Confirm that the following accessories have been supplied with your camcorder.
For details on the use of each accessory, refer to pages indicated.

(A)

1. **Battery pack NP-55 (1) (page 6)**
2. **AC power adaptor AC-V35/V35A (1) (pages 6, 9)**
3. **RFU adaptor RFU-90E or RFU-89EA (1) (pages 28, 29) (With the RFU-89EA, an aerial selector and a screwdriver are supplied.)**
4. **Lithium battery CR2025 (1) (page 12)**
5. **Shoulder strap (1) (page 5)**
6. **Lens cap (1) (attached to the camcorder) (page 18)**
7. **Jack cover (1) (attached to the camcorder)**

(A)



SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[SEMICONDUCTOR FOR CORRECTION LIST DISPLAY]

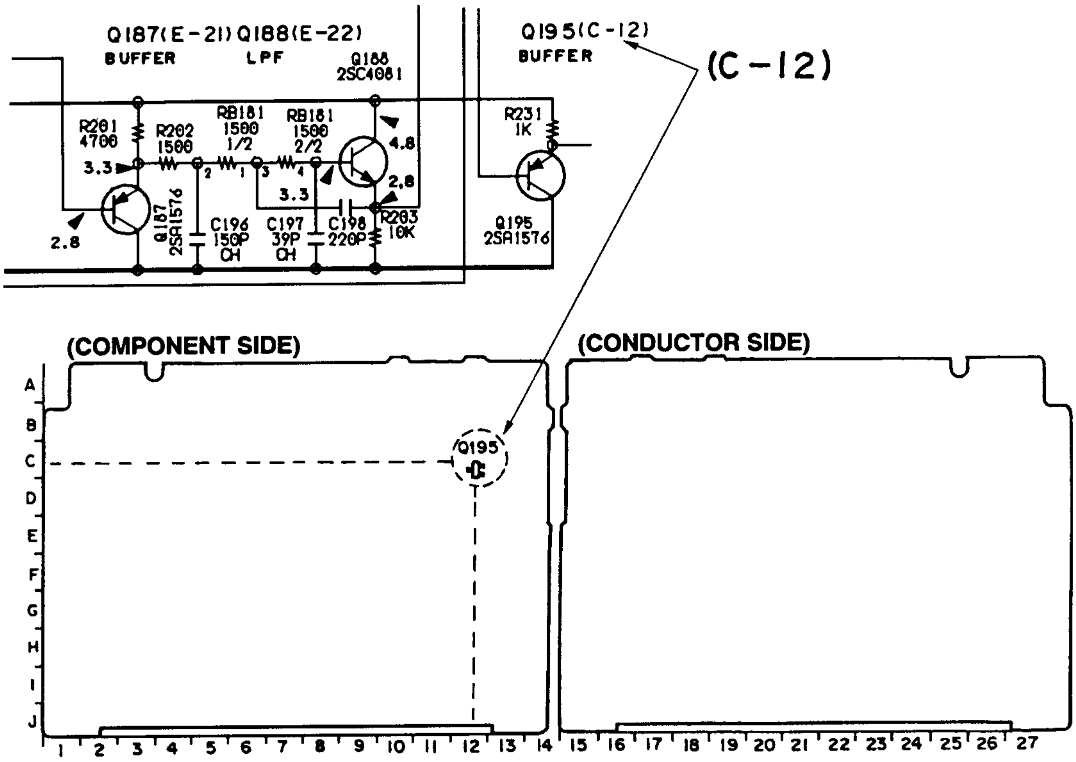
Part code and part name of the semiconductor for correction of the print board is discribed in the space of each print figure. Use this list when ordering parts.

[PARTS LOCATION DIAGRAM RELATED TO POWER SUPPLY]

The parts location diagram for the power supply which are often checked and replaced when repairing the fuse and IC link and so on. (See pages 88, 105, 139, 142.)
This diagram is useful for repair.

[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red as shown below. This enables to find the location on the board easily when servicing.



Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
2.8
4.8
2.8
3.3
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195(C-12)
BUFFER
R231
1K
Q195
2SA1576
(C-12)
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
C
D
E
F
G
H
I
J
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27

[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [✣] mark is flashing in the viewfinder at this time, head clogs are occurred.

Check During Playback of a Tape

① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

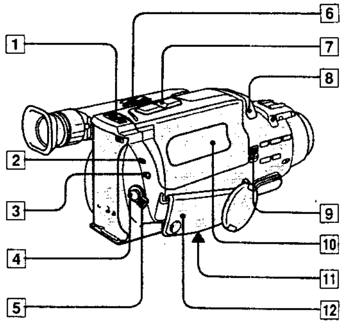
[Cleaning method using a cleaning tape]

- Use the Cleaning Tape. (Please follow the instructions attached to the cleaning tape.)

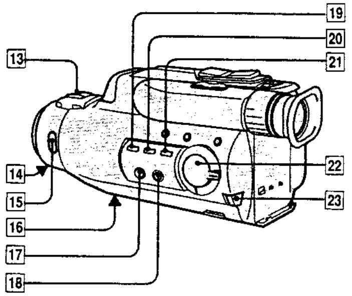
SECTION 1
GENERAL

Identifying the Parts

(B-1)



(B-2)



For details on the use of each part, refer to the pages indicated in the parenthesis.

(B-1)

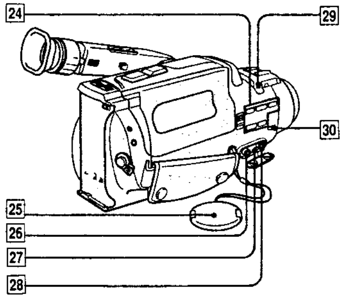
- 1 **POWER switch (13)**
- 2 **REMOTE ⅽ (LANC)* control connector (stereo mini-minijack) (24)**
- 3 **⊚ (earphone) jack (minijack) (23)**
- 4 **START/STOP button (18)**
- 5 **STANDBY switch (13)**
- 6 **EDITSEARCH (and ⊜ recording review) button (22, 23)**
- 7 **Power zoom (MACRO) button (21)**
- 8 **Built-in microphone**
- 9 **EJECT (cassette eject) knob (16)**
- 10 **Cassette holder (16)**
- 11 **Lithium battery holder (12)**
- 12 **Grip strap (18)**

(B-2)

- 13 **Accessory shoe (24)**
- 14 **FOCUS HOLD switch (25)**
- 15 **PUSH FOCUS HOLD button (25)**
- 16 **Tripod receptacle (bottom)**
- 17 **FADER button (27)**
- 18 **BACK LIGHT button (25)**
- 19 **DATE (+) button (13, 14, 20)**
- 20 **TIME (NEXT) button (13, 14, 20)**
- 21 **AGE/EVENT button (14, 20)**
- 22 **PROGRAM AE selector (18, 26)**
- 23 **BATT (battery eject) knob (7)**

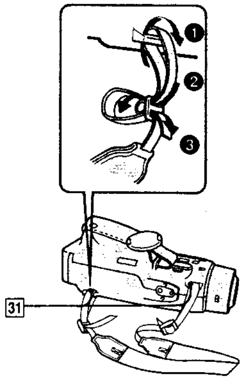
***About the d (LANC)**
ⅽ LANC stands for Local Application Control Bus System. The LANC connector is used for controlling the tape transport of video equipment and peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

(B-3)

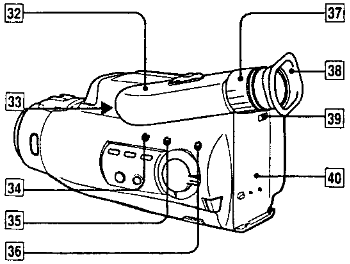


(B-4)

Attaching the shoulder strap



(B-5)



This section is extracted from instruction manual.

Identifying the Parts

(B-3)

- 24 **Tape transport buttons (32, 33)**
  - ▷ **PLAY (playback)**
  - ▶▶ **FF (fast-forward)**
  - ◀◀ **REW (rewind)**
  - □ **STOP (stop)**
  - ll **PAUSE (pause)**
- 25 **Lens cap**
- 26 **VIDEO output jack (phono jack) (30, 31)**
- 27 **RFU DC OUT (RFU adaptor DC out) jack (special minijack) (28, 29)**
- 28 **AUDIO output jack (phono jack) (30, 31)**
- 29 **MIC jack (PLUG IN POWER) (mono mini-jack) (24)**
- 30 **REC MODE (recording mode)/EDIT switch (34)**

Mode	Recording	Playback	Editing
Setting	SP LP	EDIT	EDIT
Function	Recording mode switch	EDIT switch	

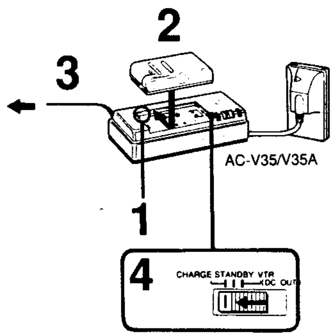
(B-4)

- 31 **Shoulder strap hook**

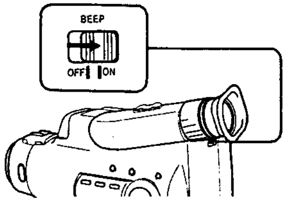
(B-5)

- 32 **Viewfinder**
- 33 **Camera recording/battery lamp (7, 18, 42)**
- 34 **COUNTER RESET button (23, 33)**
- 35 **ZERO MEM button (23, 33)**
- 36 **TAPE/BATT CHECK button (7, 24)**
- 37 **Viewfinder adjustment ring (17)**
- 38 **Eyecup (37)**
- 39 **BEEP ON/OFF switch (6)**
- 40 **Battery mounting surface**

(C-1)



(C-2)



Preparing your camcorder 1

Connecting the Power Sources

First, Choose the Power Source.

For details, see the operation manual of the accessory you want to use.

Place	Power source	Accessory to be used
Out-doors	Battery pack	NP-55 (supplied), NP-55H, NP-66H, NP-77, NP-77H or NP-77HD
	Alkaline batteries	Battery case EBP-77
Indoors	House current	AC power adaptor AC-V35/35A (supplied), AC-V30 or AC-S10
In the car	12 V or 24 V car battery	DC pack DCP-77, car battery charger DC-S10 or AC power adaptor AC-V55 and car battery cord DCC-16AE

Using the Battery Pack

Step 1

Charge the battery pack. (C-1)

1. **Align the side of the battery pack with the side of the AC power adaptor.**
2. **Slide the battery pack in the direction of the arrow.**
3. **Connect the AC power adaptor to a wall outlet.**
4. **Set the CHARGE/VTR switch on the AC power adaptor to CHARGE.** Charging begins.

	NP-55 (supplied)	NP-77H NP-77HD	NP-77	NP-66H	NP-55H
Required charging time*	60	140	120	100	70
Battery life**	60	150	120	110	75

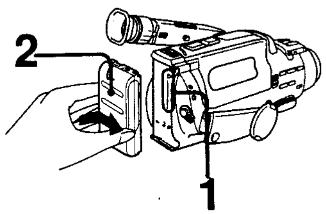
* Approximate time in minutes using AC-V35/V35A
**Approximate time in minutes using fully charged battery pack, continous recording indoors

When charging is finished, the charge indicator on the AC power adaptor will go out.

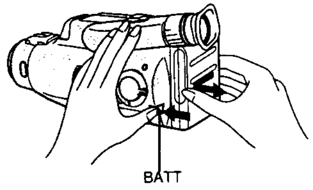
Checking the BEEP switch (C-2)

- The BEEP switch is preset to ON: the camcorder will beep when you start and stop recording and as a warning of unusual conditions (see page 42). These beeps will not be recorded on the tape.
- Set the BEEP switch to OFF, to deactivate the beep.

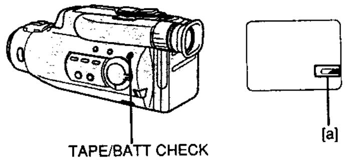
(C-3)



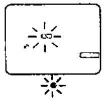
(C-4)



(C-5)



(C-6)



(C-7)

Step 2

Mount the battery pack on the camcorder. (C-3)

1. **Align the right side of the battery pack with the white line on the camcorder.**
2. **Slide in the battery pack to the right.** Make sure the battery is securely installed so that it does not fall.

Removing the battery pack (C-4)
Press BATT in the direction of the arrow, and at the same time, slide out the battery pack to the left.

Remaining battery capacity indicator

To check the remaining battery capacity, set the POWER switch to CAMERA, set the STANDBY switch up (see page 13) and press TAPE/BATT CHECK. The black bar of the remaining battery capacity indicator [a] in the viewfinder shows remaining battery power **(C-5)**. After the black bar disappears, the ▭ indicator and a red lamp will flash in the viewfinder **(C-6)**. The battery lamp on the camcorder will flash also.

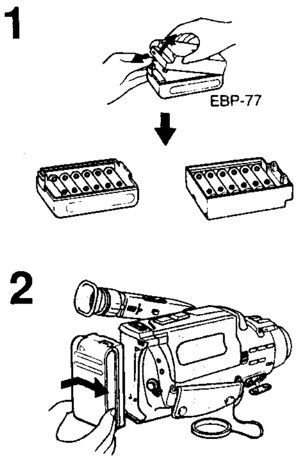
Note
The remaining battery capacity indicator of the camcorder may indicate a different remaining capacity from that on the NP-77HD battery pack.

How to use the switch on the battery pack (C-7)
This switch is provided so that you can remember the charging condition. Set the switch to the "no mark" position when charging is completed. Set the switch to the "red mark" position when the battery is used up.

Other options for charging

- AC-S10 AC power adaptor:
  This adaptor has a discharging function.
  It charges the battery pack after ensuring optimum battery capacity by complete discharging.
- DC-S10 car battery charger:
  This charger has a discharging function. When you want charging only, slide the skip switch on the charger in the direction of the arrow.

(C-8)



Using Alkaline Batteries

(C-8)

The battery case EBP-77 (not supplied) is required.

Note
You cannot use manganese batteries.

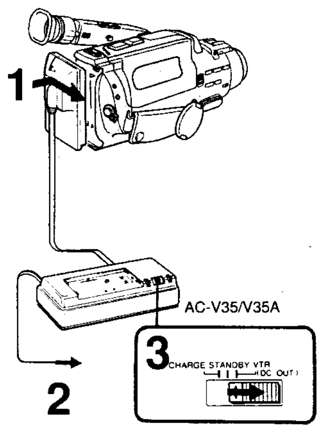
1. **Insert 12 R6 (size AA) alkaline batteries into the battery case.**
2. **Attach the battery case in the same way as the battery pack.**

Battery life (when using Sony alkaline batteries)
The battery lasts for approximately 2 hours and 15 minutes under continuous recording indoors. However, when you use non-Sony alkaline batteries, their life may shorten.

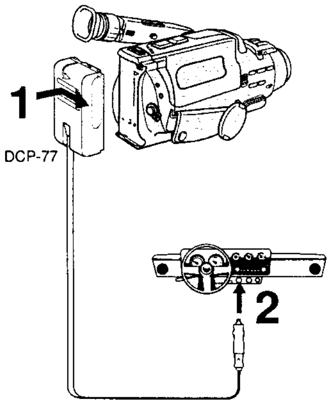
Notes on battery life
- Batteries will not last as long in cold places.
- No indicator appears in the viewfinder when the batteries are weak.

To remove the battery case
Remove it in the same way you do the battery pack. See page 7.

(C-9)



(C-10)



Using Household Current

(C-9)

Use the supplied AC power adaptor AC-V35/V35A.

1. **Align the right side of the connecting plate with the line on the camcorder, and slide it in the direction of the arrow.**
2. **Connect the AC power adaptor to a wall outlet.**
3. **Set the CHARGE/VTR switch on the AC power adaptor to VTR.**

Removing the connecting plate
Remove it in the same way as you do with the battery pack. See page 7.

Using Car Battery

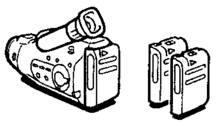
(C-10)

The DCP-77 DC pack is required (not supplied).

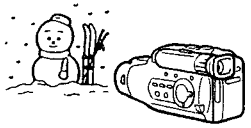
1. **Align the right side of the DC pack with the line on the camcorder, and then push down and slide it in the direction of the arrow.**
2. **Connect the cord of the DC pack to the cigarette lighter socket of a car (12 V or 24 V).**

Removing the DC pack
Remove it in the same way as the battery pack. See page 7.

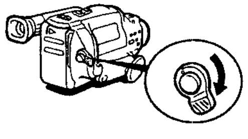
(D-1)



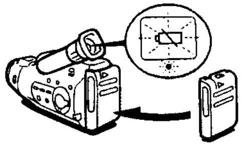
(D-2)



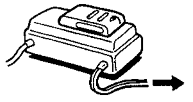
(D-3)



(D-4)



(D-5)



Using the Best out of the Battery Pack

How to Prepare the Rechargeable Battery Pack

Have sufficient battery pack power to do 2 to 3 times as much recording than you have planned. (D-1)
"Battery life" as indicated in this operation manual is measured by the continuous recording time of the camcorder, placed at room temperature using a fully charged battery.

Battery life is shorter in a cold climate. (D-2)
Battery efficiency is decreased and the battery will be used up more quickly.

Set the STANDBY switch of the camcorder down when not recording to save battery power.
A smooth recording can be made even if recording is stopped and started again. (D-3)
While positioning the subject or selecting an angle, or looking through the viewfinder lens, the lens moves automatically and the battery is used. The battery is also used when a tape is inserted or removed.

When the Rechargeable Battery Pack Should Be Replaced

After the black bar disappears in the battery life indicator, the ▭ indicator and a red lamp will start flashing in the viewfinder. When they change from slow flashing to fast flashing, replace the battery pack. (D-4)
Turn off the power switch of the camcorder and replace the battery pack. Leave the tape in the camcorder in order to obtain a smooth recording after the battery pack is replaced.

Notes on Charging

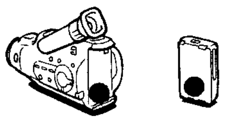
new battery pack is not charged.

Recharge the battery pack only when it is exhausted. (D-5)

- Make sure to use up the battery before charging.
- If recording is completed before the ▭ indicator appears in the viewfinder, it is recommended that you remove the cassette, set the POWER switch to CAMERA, turn the STANDBY switch up until it snaps, and leave the camcorder until the recording/battery lamp flashes rapidly. When using the AC-S10 AC power adaptor or the DC-S10 car battery charger, you can discharge the battery with their discharging function.
- Repeated charging while some capacity remains causes a lowering of battery capacity.
  However, **the original battery capacity can be recovered if you fully discharge and charge the battery again.**

Recharge the battery pack just before using.
If the battery pack is charged fully but not used for a long time (about 1 year), it becomes discharged.
Charge it again but in this case the battery life will be shortened than normal. After several charging and discharging cycles, the battery life will recover its original capacity.

(D-6)



(D-7)

Keep the Terminals Clean

If the terminals (metal parts on the back) are not clean, the battery duration will be shortened. (D-6)
When the terminals are not clean or when the battery pack has not been used for a long time, install and remove the battery pack from time to time. This will improve the contact condition. Also, wipe the + and – terminals with a soft cloth or paper.

Notes on the Rechargeable Battery Pack

Why the battery pack heats up (D-7)
During charging or recording, the battery pack heats up. This means energy has been generated and a chemical change has occurred inside the battery pack. This is not a cause for concern.

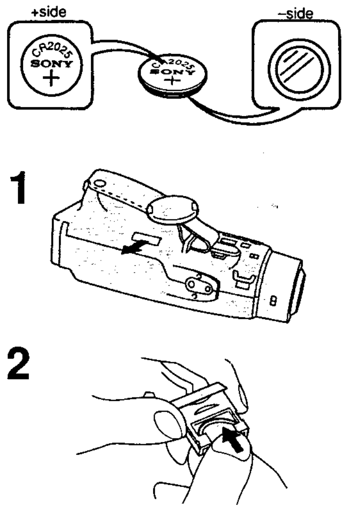
How to care for the battery pack

- Remove the battery pack from the camcorder after using it, and keep it in a cool place.
  When the battery pack is attached to the camcorder, a small amount of current flows to the camcorder even if the POWER switch is set to OFF. It causes overdischarging and shortens battery life.
- The battery pack is always discharging even when it is not in use after charging.
  Thus, it is recommended that you charge the battery right before using.

How many times can the battery pack be recharged
It can be fully charged and discharged about 500 times under normal temperatures.
If the ▭ indicator flashes rapidly just after turning on the camcorder with a fully charged battery pack, the battery pack is dead. The battery pack should be replaced with a new fully charged one.

Temperatures during charging
Charge under temperatures ranging from 10 to 30°C (50 to 85°F) is recommended. Lower temperatures require a longer charging time.

(E-1)



Preparing your camcorder 2

Setting the Date and Time

Inserting the Lithium Battery

(E-1)

To keep birth dates in the camcorder's memory as well as to activate the clock, a lithium battery (supplied) must be installed.
The lithium battery has a + (plus) side and a – (minus) side. **Be sure to install the supplied lithium batteries with the + and – ends properly position.**

1 **Remove the lithium battery holder located at the bottom of the camcorder.**

2 **Install the supplied CR2025 lithium battery with the + side facing down.**

3 **Put the lithium battery holder into the camcorder.**

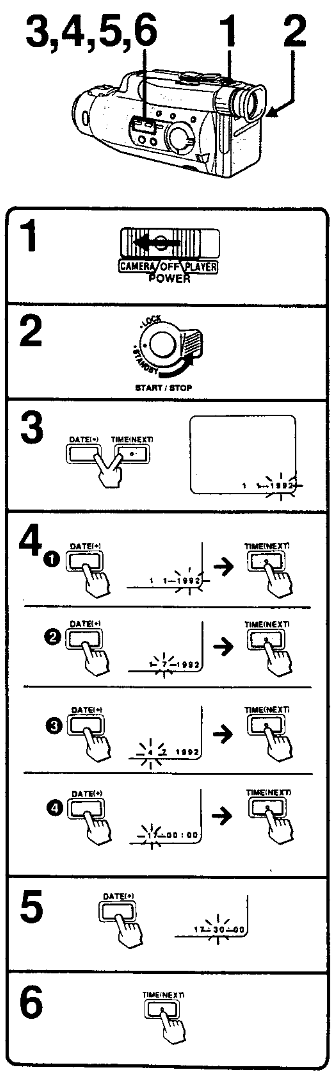
Changing the lithium battery
Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

Note on lithium battery life
The battery will last for approximately 1 year in normal operation.
When the lithium battery becomes weak, the ♲ indicator will flash in the viewfinder screen for about 5 seconds (when the POWER switch is set to CAMERA).
In this case, **replace the battery with a Sony CR2025.**
Use of any other battery may present a risk of fire or explosion.
When replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, resetting the date, time and birth dates will be necessary.

WARNING
Battery may explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

Cautions
- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Do not hold the battery with metallic tweezers, otherwise a short-circuit may occur.

(E-2)



Setting the Date and Time

(E-2)

Make sure that a power source and lithium battery are attached.

1 **Press the small green button on the POWER switch and slide it to CAMERA.**

2 **Set the STANDBY switch up.**

3 **Press DATE (+) and TIME (NEXT) simultaneously for more than two seconds until the date indicator appears in the viewfinder.**
DATE (+) now functions as + (to advance numbers) and TIME (NEXT) functions as NEXT (to execute).

4 **Adjust the flashing digits of the year, month, day and hour using DATE (+), and press TIME (NEXT).**
- When you keep DATE (+) pressed, the digits advance faster.
- The year starts at 1992, and proceeds as follows:
  1992 ----→ 1999 → 2000 ----→ 2020

5 **Adjust the flashing digits of minute using DATE (+).**

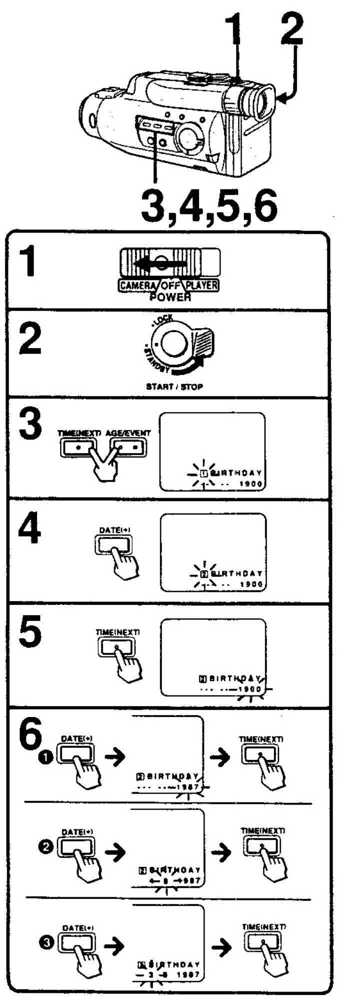
6 **Press TIME (NEXT) to set the second to "00".**
The clock starts working.

Correcting date and time setting
Repeat steps 3 to 6.

Checking the preset date and time
Press DATE (+) or TIME (NEXT). When you press the same button again, the indicator goes off.

If the camcorder goes off abruptly while setting the date and time
If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will turn off automatically. Set the STANDBY switch down once and set it up again.

(E-3)


1
2
3,4,5,6
1
CAMERA/OFF/PLAYER
POWER
2
LOCK
STANDBY
START / STOP
3
TIME(NEXT)
AGE/EVENT
1 BIRTHDAY
1900
4
DATE(+)
1 BIRTHDAY
1900
5
TIME(NEXT)
2 BIRTHDAY
1900
6
DATE(+)
2 BIRTHDAY
1987
TIME(NEXT)
DATE(+)
2 BIRTHDAY
8 1987
TIME(NEXT)
DATE(+)
2 BIRTHDAY
3 8 1987
TIME(NEXT)

Storing a Birth Date in Your Camcorder

(E-3)

When you preset your child's birth date in the camcorder, you can put your child's age in years and months on your tape. You can also preset the date of an event. Once you enter the birth date of your child, the clock inside the camcorder will automatically update the age of your child. You can superimpose the age any time on your recording. You can preset up to three birth or event dates.

Before you begin
Before storing the birth date in your camcorder, make sure that power source is connected, that the lithium battery is installed and that the date is correctly set.

Storing birth date
Example: Store "3. 8. 1987" in memory 2.

1. **Set the POWER switch to CAMERA.**
2. **Set the STANDBY switch up.**
3. **Press TIME (NEXT) and AGE/EVENT simultaneously for a few seconds until the "[1] BIRTHDAY — — 1900" indicator appears in the viewfinder.**
4. **Press DATE (+) to select [2].**
   Each time you press DATE (+), the indicator in the viewfinder changes as follows:

   [1] BIRTHDAY → [2] BIRTHDAY
   ↑ [3] EVENT* ←

   * Although "EVENT" is displayed on [3], you can use it for age as well. [1] and [2] can also used for event.
5. **Press TIME (NEXT).**
   The "1900" indicator flashes.
6. **Enter the birth date of your child.**
   First adjust the flashing digits with DATE (+), and then press TIME (NEXT). The age (year and month) appears when all items are adjusted.

If you missed the correct number with DATE(+)
Keep pressing DATE (+).
The indicator changes as follows:

Year: → 1900 → 1901 ----→ Current year
└---Current year – minus 99 ←

Month: 1→ 2---→ 12
↑

Day: 1 → 2 ----→ 31
↑

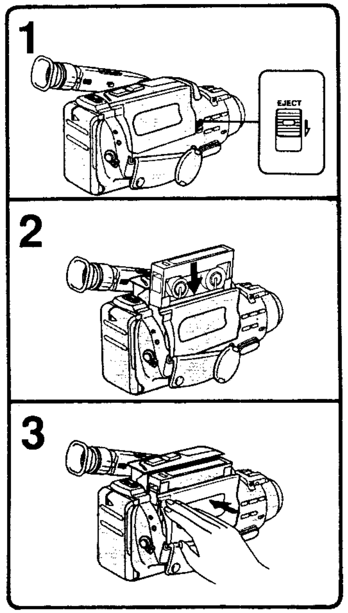
Correcting and changing the setting
Follow the procedures from step 1 again.

Advancing the digits faster
Keep DATE (+) pressed.

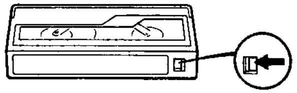
Presetting the year before 1900
1. After step 5 on page 14, keep pressing DATE (+) until the current year is displayed.
2. Press DATE (+) again
   The year goes back 99 years.
   (example: 1992 → 1893)
3. Go to step 6 on page 14.

When in 2000
"– – –1901" is displayed in step 3 on page 14.
After that, it advances every year "1902, 1903, ---".

(F-1)



(F-2)



Preparing your camcorder 3

Inserting a Cassette

Inserting a Cassette

(F-1)

Make sure that a power source is connected.

1 **While pressing the small blue button, push EJECT in the direction of the arrow.**
The cassette holder lifts up and opens.

2 **Insert a cassette with the window facing outside.**

3 **Press the PUSH mark on the cassette compartment to close the cassette holder.**

Ejecting the Cassette

Make sure that a power source is connected.
1 While pressing the small blue button, slide EJECT in the direction of the arrow.
2 Take out the cassette and press the PUSH mark to close the cassette holder.

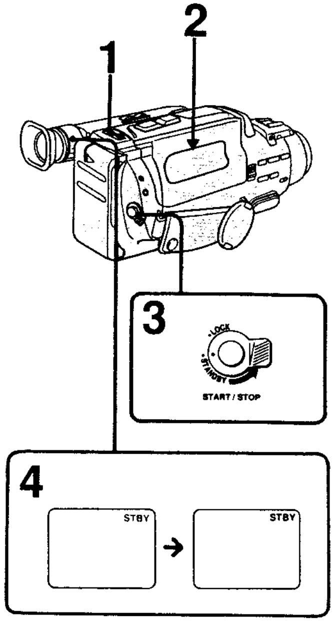
Preventing Accidental Erasure

(F-2)

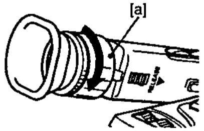
Slide the red tab to close the window to prevent accidental recording. To re-record on the tape, slide the tab opening the window.
If you try to record with the red mark exposed, the 🖭 and ⏏ indicators flash in the viewfinder and beeps sound for about 5 seconds.

Note on handling cassettes
Never insert anything in the small holes on the rear of the cassette. These holes are used to sense the type of tape, thickness of tape, or if red mark is exposed or covered, etc.

(G-1)



(G-2)



Preparing your camcorder 4

Adjusting the Viewfinder Lens

The position of the viewfinder lens for optimum vision varies depending on the person. Adjust it when using for the first time, or when using after someone else. **(G-1)**

Make sure a power source is connected.

1 **While pressing the green button, set the POWER switch to CAMERA.**

2 **Insert a cassette (see page 16).**

3 **Set the STANDBY switch up until it snaps.**

4 **Turn the viewfinder lens adjustment ring [a] so that the "STBY" in the viewfinder screen comes into sharp focus.**

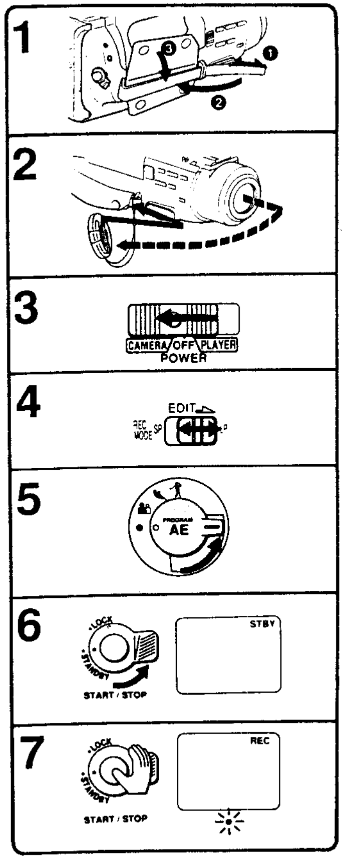
Using the viewfinder as a sports finder

The sports finder allows you to monitor the picture while your eye is at a distance from the eyecup.

Setting the viewfinder to the sports finder position
Turn the viewfinder adjustment ring [a] clockwise completely. **(G-2)**

Returning to the normal viewfinder position
Turn the adjustment ring counterclockwise until "STBY" in the viewfinder comes into sharp focus when a cassette is in your camcorder.

(H-1)



Operating the Camera Section

Recording a Picture Using Automatic Adjustments

Before recording "once-only" events, we strongly recommend you make a trial record and check that everything is working perfectly.

To start Recording

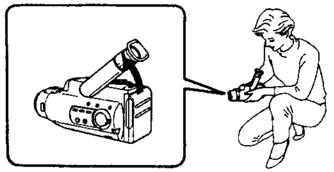
(H-1)

1. **Hold the camcorder by putting your hand through the grip strap so that your thumb can easily press the red START/STOP button.**
2. **Remove the lens cap and attach it to the grip strap.**
3. **While pressing the green button, set the POWER switch to CAMERA.**
4. **Set the REC MODE switch to LP (long play) or SP (standard play), according to the length that you plan recording.**
5. **Set the PROGRAM AE switch to the green position.**
6. **Turn the STANDBY switch up.**
   "STBY" appears in the viewfinder. Now you can see through the viewfinder.
7. **Press START/STOP (red button).**
   A beep sounds if the BEEP switch is set to ON. "REC" appears and the red lamp lights up in the viewfinder and the camera recording/battery lamp lights on the camcorder. The camcorder is now recording.

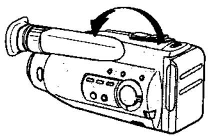
To standby (to stop momentarily)
Press START/STOP again.
Two beeps sound and "STBY" appears in the viewfinder.

To stop
Set the STANDBY switch down and set the POWER switch to OFF.

(H-2)



(H-3)



Recording a Picture Using Automatic Adjustments

For low-position recording (H-2)
Set the viewfinder to the sports finder position (page 17) and turn it for a recording in low position.
(The viewfinder barrel can be turned 180 degrees.)
(H-3)

If the tape reaches near the end during recording
The ⊡ indicator in the viewfinder and the camera recording/battery lamp on the camcorder flash slowly.
When the tape reaches its end, flashing becomes rapid and beeps sound for about 5 seconds (if the BEEP switch is set to ON).

Notes on recording

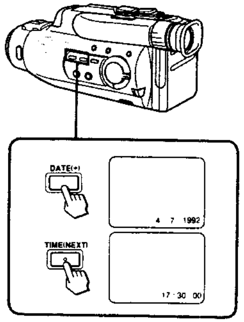
- To record from the beginning of the tape, run the beginning of the tape for about 15 seconds before recording. This will avoid missing the starting point when the tape is played back.
- When moving from indoors to outdoors, or vice versa, set the STANDBY switch up and point the camcorder at a white object for about 10 seconds so that the white balance is properly adjusted.

Note on standby mode
If you leave the camcorder in standby mode for 5 minutes or more, the camcorder will be automatically turned off. To resume standby mode, set the STANDBY switch down once and slide it up again.

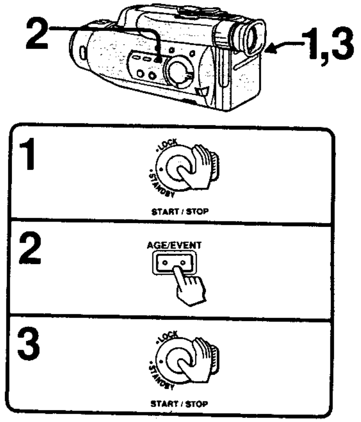
Note on light sources
If you are shooting a subject in bright conditions just after shooting in a dark place, the picture may not appear in the viewfinder. In this case, point the camcorder in the other direction.

Recording mode
An 8 mm video format cassette records in the SP (standard play) mode and in the LP (long play) mode and can play back in the SP mode and LP mode.
The quality of the recording picture in the LP mode, however, will not be as good as that in the SP mode.

(H-4)



(H-5)



Recording the Date or Time

(H-4)

During camera recording or when in standby mode, press DATE (+) for the date indicator or TIME (NEXT) for the time indicator.
The date or time indicator displayed in the viewfinder is recorded with the picture.

To stop recording date or time
Press DATE (+) or TIME (NEXT) again.
The picture recording continues.

Putting an Age on Your Tape

Here is how to put the ages of your children on your tape while recording. **(H-5)**

1. **During recording, press START/STOP at the point where you want to insert the age of a person or the elapsed time.**
   This puts the camcorder in standby mode.
2. **Press AGE/EVENT to select the indicator you want to record.**
   Each time you press AGE/EVENT, the indicator changes as follows:

   No indicator → [1] The first age
   ↑ ↓
   [3] The third age ← [2] The second age

   An item with no presetting is skipped. The [1], [2] or [3] indicator goes out after one second.
3. **Press START/STOP.**
   Recording starts again. The age indicator in the viewfinder is recorded with the picture.

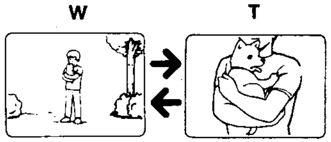
To stop recording the age
Press AGE/EVENT until the indicator goes out.

Changing the display while recording
Press AGE/EVENT until the indicator you want to record is displayed. Recording of the indicator you selected starts when [1], [2] or [3] goes out.

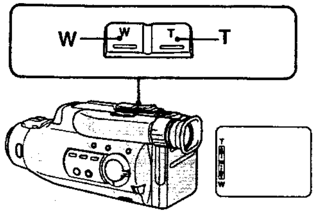
Canceling the stored birth date
1. Perform step 1 to 4 in "Storing a Birth Date in Your Camcorder" on page 14, to select the memory number to be canceled.
2. Press TIME (NEXT) twice. The month indicator flashes.
3. Press DATE (+) until "-- --" appears.
4. Press TIME (NEXT).
   The birth memory is deleted from the memory and is not displayed when you press AGE/EVENT.

Note
You cannot add the age later during playing back or editing.

(H-6)



(H-7)



Using the Zooming Features

By zooming, you can change the size of the subject in the scene. Use "zoom-in (Telephoto)" for dramatic close-ups, and "zoom-out (Wide-angle)" for panoramic long shooting. Also use the zoom to focus manually or to decide the shooting angle. A common mistake is using zoom-in or zoom-out too often. Use the zoom sparingly. **(H-6)**

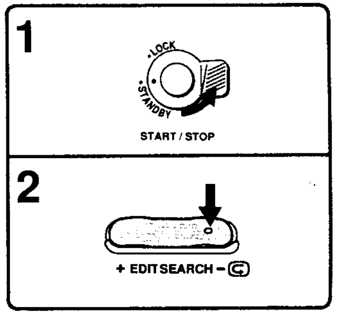
Two-levels Speed Zooming (H-7)
The camcorder's power zoom button offers two-level speed zooming.
Press the button firmly for high speed zooming and softly for relatively slow zooming.
W side: for wide-angle (subject appears farther away)
T side: for telephoto (subject appears closer)

Focusing in Macro

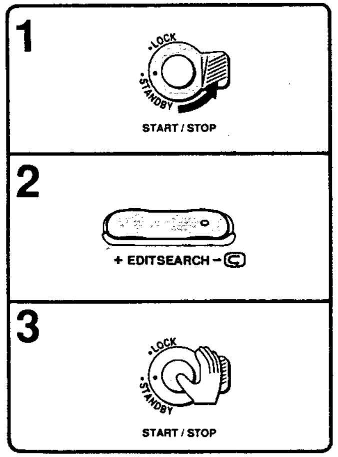
Even small subjects such as flowers, insects, and images in photographs, can literally fill the screen using focus in macro.
1. **Bring the camcorder as close as necessary to obtain the desired subject size.**
2. **Press the W side of the power zoom button until the indicator in the viewfinder stops at the W end.**

You can shoot a subject that is at least 1 m (about $39^{3}/_{8}$ iches) away from lens surface in the telephoto position.

(H-8)



(H-9)



Checking the Recorded Picture in the Viewfinder (EDITSEARCH)

Using EDITSEARCH (⊜), you can review the last recorded scene or check the recorded picture in the viewfinder. After checking your recorded picture, you can also re-record over a previously recorded portion.

Reviewing the last recorded scene – Rec review
You can check the last portion of a scene you just recorded in CAMERA mode. This is convenient for quick, on-the-spot checks. **(H-8)**

1 **Set the camcorder into standby mode by setting the STANDBY switch up.**

2 **Press the – side of EDITSEARCH (⊜) momentarily.**
The last few seconds of the recording portion are played back in the viewfinder. Then, the camcorder goes back to standby mode, ready for the next recording.

Checking your recorded picture – Editsearch
You can check the recorded picture in the viewfinder. After checking, you can also re-record over a previously recorded portion. **(H-9)**

1 **Set the camcorder in standby mode by setting the STANDBY switch up.**

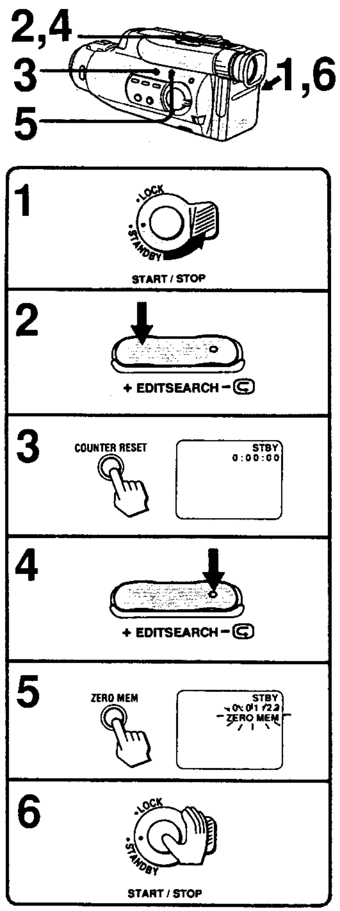
2 **Keep pressing the + side or – side of EDITSEARCH (⊜) to play back the picture while looking in the viewfinder.**
+ side: to view the forward playback picture
– side: to view the reverse playback picture
To stop playback, release EDITSEARCH.

3 **If you want to re-record over a recorded portion, follow the procedures below:**

  1 Press the + or – side of EDITSEARCH to locate the point you want to begin the re-recording.

  2 Press START/STOP to start re-recording. Re-recording begins from the point you released EDITSEARCH. As long as the tape is not ejected, the transition between the scenes will be smooth.

(H-10)



Monitoring the sound while viewing the playback picture in the viewfinder by using an earphone (not supplied)
1 Connect an earphone to the ⊕ jack.
2 While pressing the green button, set the POWER switch to PLAYER.
3 Press ◀◀ to rewind the tape and press □ where you want to stop.
4 Press ▷ to start playback.

Re-recording a Picture in the Middle of a Recorded Tape (Insert Recording)

(H-10)

1 **Set the STANDBY switch up to set the camcorder into standby mode.**

2 **While looking in the viewfinder, keep pressing the + or – side of EDITSEARCH and release the button where you want to end the insertion.**

3 **Press COUNTER RESET.**
The counter is reset to zero.

4 **While looking in the viewfinder, keep pressing the – side of EDITSEARCH and release the button at the point where you want to start the insertion.**

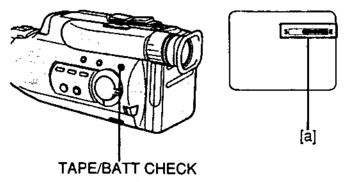
5 **Press ZERO MEM.**
The insert ending point is stored in memory.

6 **Press START/STOP.**
A beep sounds (if the BEEP switch is set to ON) and insert recording begins. The insert recording stops automatically near the counter zero point.

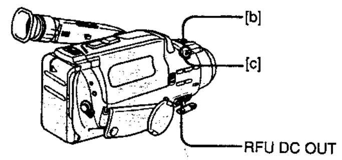
Canceling the ZERO MEM
Press ZERO MEM.

Note
The picture may be distored at the end of the inserted portion when played back.

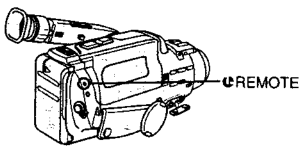
(H-11)



(H-12)



(H-13)

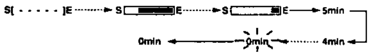


Checking the time remaining on the tape

(H-11)

Press TAPE/BATT CHECK.

After pressing TAPE/BATT CHECK, the remaining tape length indicator [a] may not appear for about 20 seconds. When the time remaining is less than about 5 minutes, the indicator shows the minutes remaining.



When "5 min" appears, the 🖭 indicator flashes in the viewfinder.

Notes on the remaining tape length indicator
- The camcorder must be in the recording or playback mode when TAPE/BATT CHECK is pressed to find out the time remaining. In the playback mode, however, the indicator does not show the minutes remaining.
- The tape length indicator does not change while using EDITSEARCH.

Recording with an External Microphone

(H-12)

You can connect an external microphone (not supplied) to the MIC jack [C]. This jack also accepts a "plug-in power" microphone.
If the microphone has two plugs, connect the DC IN plug to the RFU DC OUT jack on the camcorder.
Attach the microphone to the accessory shoe [b] of the camcorder.

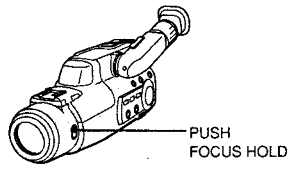
Note
When using an external microphone, wind noise is not muted.

Connecting a Wired Remote Control Unit

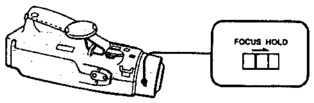
(H-13)

When you connect a wired remote control unit or editing controller (not supplied) to the ᗕ REMOTE connector, you can operate your camcorder from a distance.

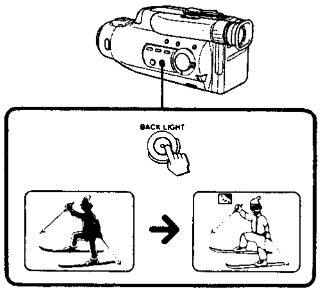
(I-1)



(I-2)



(J)



Manual Adjustments

The camcorder's automatic functions offer you worry-free operation under most shooting conditions. But in some circumstances, manual adjustment is better for effective recording.
You can manually maintain focus and compensate for backlighting with this camcorder.
Some shooting situations may call for using some items manually, while others may call for using them automatically.
The previous manual settings are retained, as long as you do not remove the battery, even if you set the POWER switch to OFF.

Maintaining Focus

Your camcorder may automatically refocus on a subject other than the desired subject.
In such cases, use the PUSH FOCUS HOLD button or the FOCUS HOLD switch to keep the desired subject in focus.

Hold down the PUSH FOCUS HOLD button. (I-1)
The focus is maintained and the ⊕ indicator is displayed while you hold down this button.

To maintain the focus without having to keep pressing the PUSH FOCUS HOLD button, use the FOCUS HOLD switch **(I-2)**.

While pressing the PUSH FOCUS HOLD button, slide the FOCUS HOLD switch in the direction of the arrow. You may now release the PUSH FOCUS HOLD button.
Your camera's focus is held and the ⊕ indicator appears in the viewfinder.

To resume automatic focus, slide the FOCUS HOLD switch in the opposite direction of the arrow.

Note
When using a Sports Pack or Marine Pack, set the FOCUS HOLD switch in the direction of the arrow.

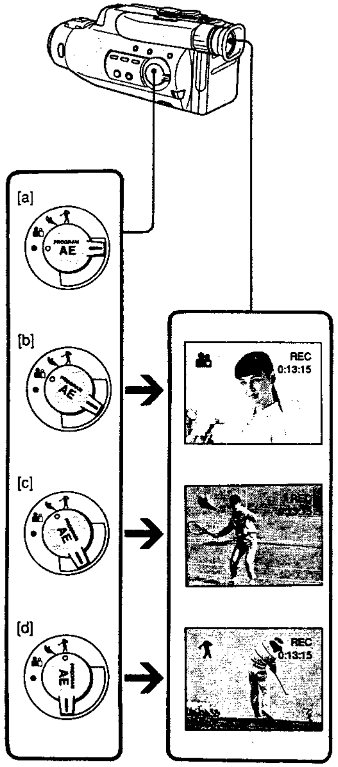
Compensating Backlighting

In this camcorder, the iris is automatically controlled. However, when shooting a subject that is backlit, that is, if the light source is coming in from the back of the subject, use the BACK LIGHT button. **(J)**

Press BACK LIGHT.
The ☒ indicator appears. If it does not appear, press the button again.

After shooting, be sure to release this adjustment condition by pressing BACK LIGHT again. (The ☒ indicator goes out.)
Otherwise, the recorded picture will become too bright.

(K)



Using Program AE (Auto Exposure)

When you see the PROGRAM AE (Auto Exposure) function, you can give a "portrait" effect (shallow depth of field) or capture high-speed action with "sports" mode or "high-speed shutter" mode.

What is PROGRAM AE (Auto Exposure)?
Program AE automatically selects just the right combination of shutter and aperture settings and gives you creative control for depth of field (distance range of objects that will be in sharp focus.) There are four preprogrammed modes: Normal (the green position), Portrait, Sports and High-speed shutter.

(K)
Selecting AE mode
Set the PROGRAM AE selector to the desired mode.
The selected mode is indicated in the viewfinder.

To resume the automatic mode
Set the PROGRAM AE selector to the green position. **[a]**

Use the appropriate mode when shooting the following subjects or when shooting under the following conditions.

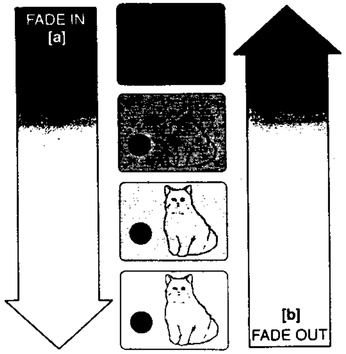
Portrait Mode [b]
- a still subject such as person or flower
- zooming in a subject in the telephoto mode
- when there is something between the camcorder and the subject, such as a chain link fence

Sports Mode [c]
- outdoor sports scene such as football or tennis.
- recording a landscape in the running car
- subjects moving at high speed, such as a roller coaster on a cloudy day

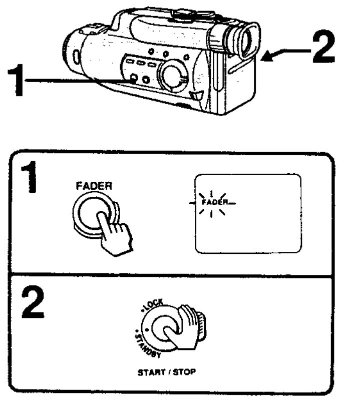
High-speed Shutter Mode [d]
- shooting a golf swing or a tennis match with the tennis ball captured clearly.
- you wish to play back certain scenes with high-speed movement in a clear, sharp picture.

Note
The shutter speed in each PROGRAM AE mode is as follows:
Portrait mode — between 1/50 to 1/2000
Sports mode — between 1/50 to 1/500
High-speed shutter mode — 1/4000

(L-1)



(L-2)



Fade-in and Fade-out

You can fade-in or fade-out to give your recording a professional appearance.
When fading-in [a], the picture will gradually appear from black. The sound will also gradually increase.
When fading-out [b], the picture will gradually fade to black. The sound will decrease. **(L-1)**

(L-2)

Fading-in

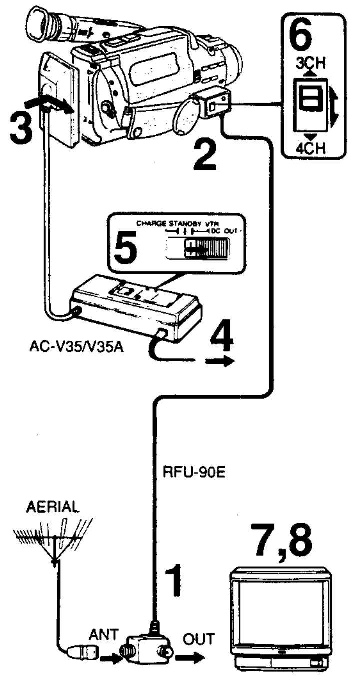
1. **Press FADER after setting the STANDBY switch up to put the camcorder into standby mode.**
   The fade indicator starts flashing.
2. **Press START/STOP.**
   The fade indicator stops flashing and the recording starts fading in.

Fading-out

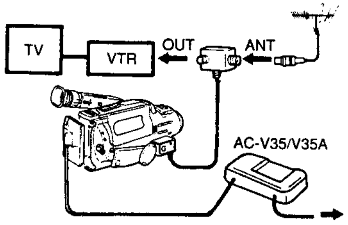
1. **Press FADER while recording.**
   The fade indicator starts flashing.
2. **Press START/STOP.**
   The fade indicator stops flashing and the picture fades out and then the recording stops.

To cancel the fade-in/fade-out function
Before pressing START/STOP, press FADER again.

(M-1)



(M-2)



Operating the Player section

Connections for Playback

You must connect the camcorder to the TV and /or VTR properly to view the playback picture.
Check if your TV has audio/video input jacks. For details on the TV and VTR, refer to their operation manuals.

Connecting a TV without Audio/ Video input jacks

For the customers supplied with the RFU-90E

(M-1)

1 **Connect the aerial and TV to the RFU adaptor.**

2 **Connect the RFU adaptor to the camcorder.**

3 **Attach the connecting plate on the AC power adaptor to the camcorder.**

4 **Connect the AC power adaptor to a wall outlet.**

5 **Set the CHARGE/VTR switch on the AC power adaptor to VTR.**

6 **Select the RF unit selector of the RFU adaptor to 3CH or 4CH whichever is not used in your area.**

7 **Turn on the TV and select the 0 position.**

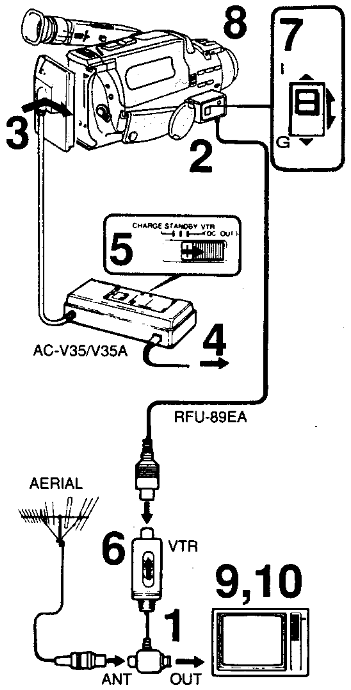
8 **Tune the TV so that you can get picture and sound from the camcorder.**

Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

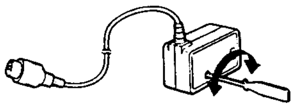
When you watch a TV programme
Set the CHARGE/VTR switch on the AC power adaptor to STANDBY or turn off the power of the camcorder.

If your TV is connected with a VTR (M-2)
Connect the camcorder to the VTR instead of the TV.

(M-3)



(M-4)



For the customers supplied with the RFU-89EA

(M-3)

1 **Connect the aerial and TV to the RFU adaptor.**

2 **Connect the RFU adaptor to the camcorder.**

3 **Attach the connecting plate of the AC power adaptor to the camcorder.**

4 **Connect the AC power adaptor to a wall outlet.**

5 **Set the CHARGE/VTR switch on the AC power adaptor to VTR.**

6 **Set the selector switch of the aerial selector to VTR.**

7 **Set the I/G selector of the RFU adaptor according to the TV system of your country.**

8 **Set the POWER switch of the camcorder to CAMERA, insert a cassette and set the STANDBY switch up.**

9 **Turn on the TV and select a programme position that is not used to receive a TV station.**

10 **Tune the TV so that you can get picture and sound from the camcorder.**

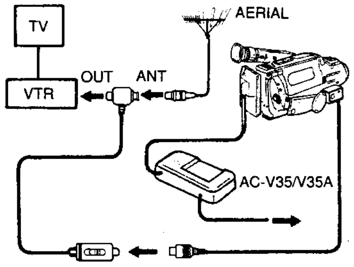
When the picture from the camcorder is not free of disturbance (M-4)

1 Set the ANT/VTR selector on the aerial selector to ANT.
2 Select a programme position between UHF channels 30 and 39 so that the TV shows no picture and a steady rustling sound or no sound is heard.
3 Set the ANT/VTR selector on the aerial selector to VTR.
4 Turn the screw on the RFU adaptor slowly with the supplied screwdriver so that the picture from the camcorder is clearly displayed on the TV screen.

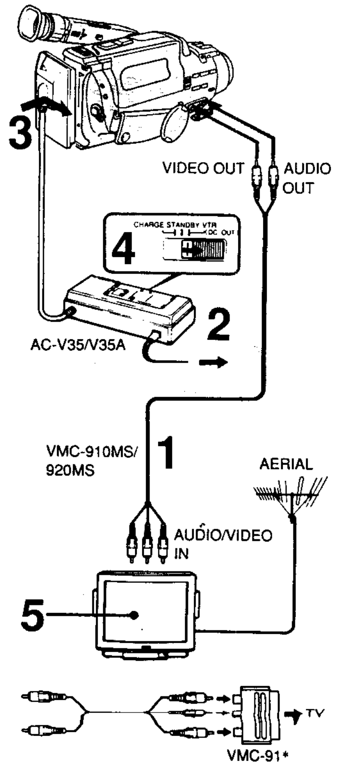
Usually keep the AC power adaptor, the RFU adaptor and the TV connected.

When you watch a TV programme
Set the selector switch of the aerial selector to ANT.

(M-5)


TV
VTR
OUT
ANT
AERIAL
AC-V35/V35A

(M-6)


3
VIDEO OUT
AUDIO OUT
4
2
AC-V35/V35A
VMC-910MS/ 920MS
1
AERIAL
AUDIO/VIDEO IN
5
TV
VMC-91*

Connections for Playback

If your TV is connected with a VTR (M-5)
Connect the camcorder to the VTR instead of the TV.

Connecting to a TV with Audio/ Video Input Jacks

(M-6)

Leave the TV aerial cable connected to the TV.

1 **Connect the camcorder to the TV.**
Use an appropriate A/V connecting cable according to the connector type of your TV. Sony offers you the following cables (not supplied).
VMC–710M/720M: for monaural TV
VMC–910MS/920MS: for stereo TV
When your TV has a 21-pin connector (EUROCONNECTOR)*, use a 21-pin adaptor VMC-91 (not supplied).

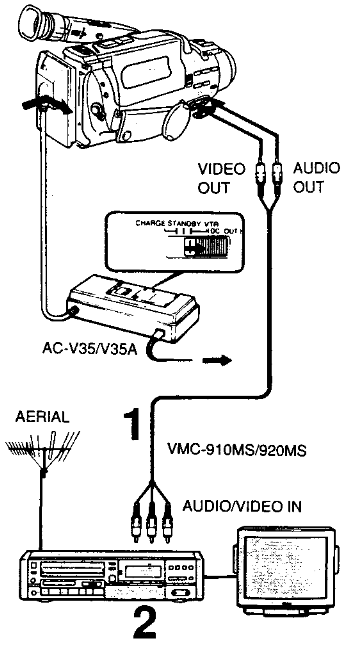
2 **Connect the AC power adaptor to a wall outlet.**

3 **Attach the connecting plate of the AC power adaptor to the camcorder.**

4 **Set the CHARGE/VTR switch on the AC power adaptor to VTR.**

5 **Turn on the TV and set the TV/VIDEO selector on the TV to VIDEO.**

(M-7)

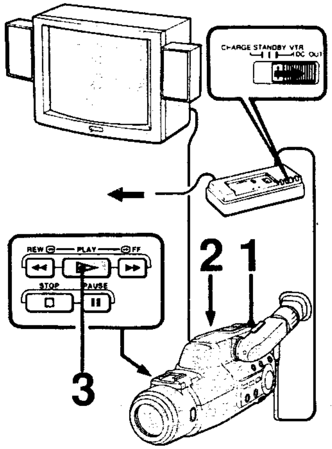

VIDEO OUT
AUDIO OUT
AC-V35/V35A
AERIAL
1
VMC-910MS/920MS
AUDIO/VIDEO IN
2

Connections for Playback

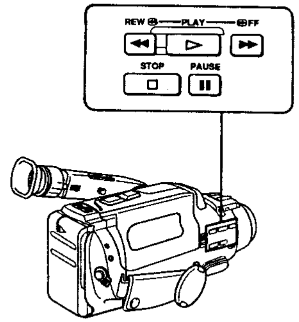
Connecting to a TV via a VTR (M-7)
Leave the VTR aerial cable connected to the VTR.

1 **Connect the camcorder to the VTR using the A/V connecting cable.**
2 **Set the input selector on the VTR to LINE and set the TV/VIDEO selector on the TV to VIDEO.**

(N-1)



(N-2)



Playing Back a Tape

Turn on the TV, and select the channel for viewing a playback picture (set the TV/VIDEO selector to VIDEO). Of course, you can monitor the playback picture in the viewfinder at the same time.

(N-1)

1 **Set the POWER switch to PLAYER while pressing the green button.**

2 **Insert a cassette.**

3 **Press ▷.**
Playback starts.

To view the still picture (playback pause), press **II** PAUSE during playback.
II appears in the viewfinder.
To resume normal playback, press ▷ or **II**.

Note
When the still picture mode lasts for 5 minutes or more, the camcorder automatically enters the stop mode.

To rewind the tape, press ◀◀.

To advance the tape rapidly, press ▶▶.

To stop playback, press □.

To stop the tape momentarily, press **II**.

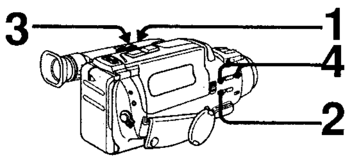
Monitoring a High-Speed Picture

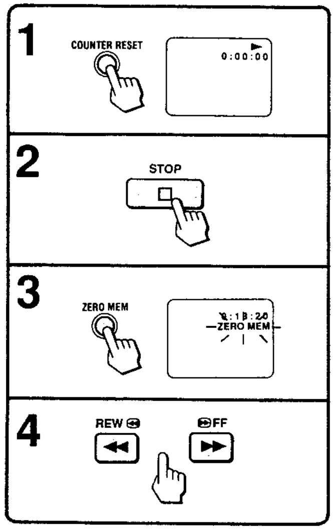
(N-2)

To locate the desired scene (picture search)
Keep pressing ◀◀ or ▶▶ during playback or in the still picture mode. ⊖ or ⊕ appears in the viewfinder.
To resume normal playback, release the button.

To locate the desired scene quickly (skip scan)
Press ◀◀ while rewinding or ▶▶ while advancing the tape rapidly. ⊖ or ⊕ appears in the viewfinder.
To resume normal playback, press ▷.

(O)





Using the Tape Counter

During recording or playback, the digits on the counter indicate the actual recording or playback time.

Counting the Whole Tape

Press COUNTER RESET at the beginning of the tape so that the counter shows "0:00:00".

To Return to a Pre-registered Point

(O)

1 **During playback, press COUNTER RESET at the point you later want to locate.**
The counter shows "0:00:00".

2 **Press □ when the playback has finished, as usual.**

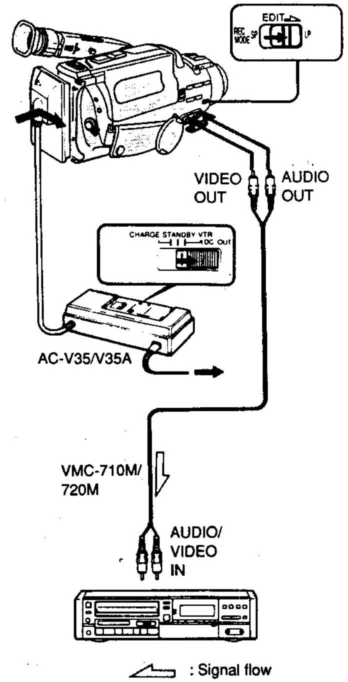
3 **Press ZERO MEM.**
The "ZERO MEM" indicator flashes in the viewfinder.

Note
Be sure to press ZERO MEM after you stop the tape. It does not function during playback.

4 **Press ◀◀ or ▶▶.**
The tape rewinds or advances and stops automatically when the counter reaches approximately zero.

Notes on the tape counter and ZERO MEM button
- Something must be recorded on the tape in order for the tape counter to function. Tape counter will not work on blank tape.
- The counter reading and the point of the tape may not correspond exactly. Use the counter as a guide. There will be a time lag of several seconds especially when you repeat fast-forward running/rewinding and play back the tape recorded in LP and SP modes mixed.

(P)



Editing onto Another VTR

You can create your own video program by editing with any other 8-mm, Betamax or VHS format VTR.

Before You Begin

(P)

- Make connections using an appropriate A/V connecting cable according to the connector type of your VTR.
  Sony offers you the following cables (not supplied).
  [a] VMC-710M/720M: for monaural type VTR
  [b] VMC-910MS/920MS: for stereo VTR

- Set the input selector of the VTR to LINE, if available.

Operation

1 Insert a cassette to be recorded on into the recording VTR.
2 Set the EDIT switch on the camcorder to the direction of the arrow (EDIT ON).
3 Set the CHARGE/VTR switch on the AC power adaptor to VTR.
4 Set the POWER switch of the camcorder to PLAYER and insert your recorded cassette.
5 Play back on the camcorder and locate the point where you wish to start editing and set the camcorder to the playback pause mode.
6 On the recording VTR, locate the recording starting point and set the VTR to the recording pause mode.
7 Press II of the VTR and camcorder simultaneously to start editing.

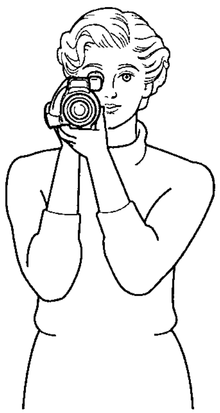
To stop editing momentarily, press **II** on the recording VTR.

To edit more scenes, repeat steps 5 to 7.

To stop editing, press □ on the VTR and camcorder.

Use of the EDIT switch
When you set the EDIT switch to the direction of the arrow (EDIT ON), picture deterioration resulting from editing can be kept to the minimum. Avoid using the edited tape for multiple generations of editing. After editing, be sure to set this switch in the opposite direction of the arrow (EDIT OFF).

(Q)



For Your Information

Hints for Better Shooting

Getting Stable Pictures

Take a good posture for shooting (Q)
For hand-held shots, it is important to hold the camcorder properly.
- Hold the camcorder firmly and secure it with the grip strap so that you can easily manipulate the camcorder with your thumb.
- Place your right elbow firmly against your side.
- Place your left hand under the camcorder to support it. When adjusting the focus manually, make sure the camcorder does not move.
- Place your eye firmly against the viewfinder eyecup.

Use a tripod
If you have a tripod for a still camera, you can also use it with the camcorder. If a tripod is not available, try placing the camcorder on a tabletop or any other flat surface of suitable height.

Note
When attaching a tripod other than Sony's, make sure that the length of the camera mounting screw is less than 6.5 mm. Otherwise, the screw may damage the inner parts of the camcorder.

Keep the horizontal plane level
The horizontal plane can be easily determined by using the viewfinder frame as a reference.

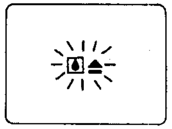
Lighting

Shoot with the sun behind you
When the light source is behind the subject, or in the following situations, the subject will be recorded too dark and the background too light.
- The subject is indoors and there is a window behind the subject.
- Bright sources such as fluorescent or incandescent lamps are included in the scene.
- You are shooting a person wearing white or shiny clothes in front of a white background.
  In this case, the face will be recorded too dark.

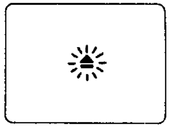
Use video light (not supplied) in the dark
To get the best colours, you must maintain a very high lighting level. When using a video light, attach it to this camcorder with a video light attachment (not supplied).

Notes and Precautions

(R-1)



(R-2)



Notes on Moisture Condensation

If the camcorder is brought directly from a cold place to a warm place, moisture may condense inside the camcorder, on the surface of the tape or on the lens. In this condition, the tape may stick to the head drum and be damaged or the unit may not operate correctly. To prevent possible damage under these circumstances, the camcorder is furnished with moisture sensors. However, take the following precautions.

If moisture condenses inside the unit (R-1)
Moisture is present inside the camcorder when:

- the ▣ indicator in the viewfinder flashes. When the cassette is inserted, the ⏏ indicator also flashes.
- beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

In such cases, no function except for cassette ejection will work.
Eject the cassette, turn off the camcorder, and leave it with the cassette holder open for at least 1 hour.
The camcorder can be used again if the ▣ indicator does not appear when the power is turned on again.

If moisture condenses on the surface of the tape (R-2)
Moisture is present on the surface of the tape when:

- The ⏏ indicator flashes in the viewfinder when the cassette is inserted and a tape transport button (▷, ◀◀ etc.) is pressed.
- Beeps sound continuously for about 5 seconds when the BEEP switch is set to ON.

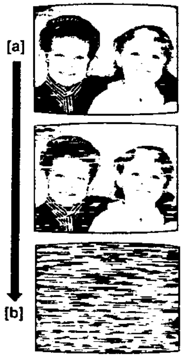
In such cases, no function except for cassette ejection will work.
Eject the cassette and let it sit for at least 1 hour.
The cassette can be used again if the ⏏ indicator does not appear when the cassette is inserted and a tape transport button is pressed.

If moisture condenses on the lens
No caution indicators will appear, but the picture becomes dim.
Turn off the power and leave the camcorder unused for at least 1 hour.

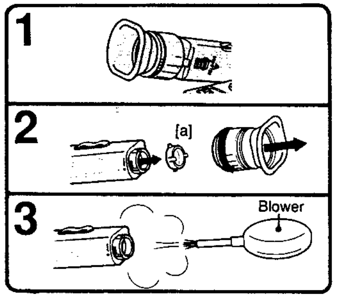
How to prevent moisture condensation
When bringing the camcorder from a cold place to a warm place, put the camcorder in a plastic bag and allow it to adapt to room conditions over a period of time.

1 Be sure to tightly seal the plastic bag containing the camcorder.
2 Remove the bag when the air temperature inside it has reached the temperature of its surroundings (after about one hour).

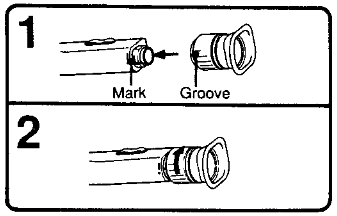
(R-3)



(R-4)



(R-5)



Notes on Video Head Cleaning

(R-3)

To ensure clear picture, clean the video heads periodically.
When playback pictures are noisy or hardly visible, the video heads may be contaminated.
[a] Slight contamination
[b] Critical contamination
In such cases,

1 Clean the video heads with the Sony V8-25CLH cleaning cassette (not supplied), referring to its instructions.
2 After cleaning, check if the picture is clear by recording or playing back with an ordinary tape.
3 If the picture is still noisy, repeat cleaning. (Do not repeat cleaning more than 5 times.)

Caution
Do not use a commercially available wet-type cleaning cassette. It may damage the video heads.

Note
If the V8-25CLH cleaning cassette is not available in your area, consult your Sony service facility.

Viewfinder Cleaning

(R-4)

1 **Pull the switch on the viewfinder barrel down.**

2 **Turn the eyecup in the direction of the arrow and detach the eyecup.**
The small lens in the viewfinder can be removed. [a]

3 **Clean the surface of the screen with a commercially available blower.**

To reattach the eyecup (R-5)

1 Align the groove on the eyecup with the ● mark on the barrel.
2 Turn the eyecup in the reverse direction of the arrow.

Precautions

On operation

- Operate the camcorder on 6.0 V (battery pack), 7.5 V (AC power adaptor), or 9.0 V (alkaline batteries).
- For DC or AC operation, use the accessories recommended in this manual.
- Should any solid object or liquid fall into the casing, unplug the camcorder and have it checked by qualified personnel before operating it any further.
- Do not hold the camcorder by the viewfinder or the microphone.
- Avoid rough handling or mechanical shock. Be particularly careful of the lens.
- Keep the lens cap on the lens when not using the camera.
- Do not wrap up the camcorder and operate it because heat may build up internally.
- Keep the camcorder away from strong magnetic fields or mechanical vibration.
- **Do not let sand get into the camcorder. When you use the camcorder on a sandy beach or dusty place, protect it from the sand or dust. Sand or dust may cause the unit to malfunction and sometimes the malfunction cannot be repaired.**
- **Do not let the camcorder get wet. Keep the camcorder from rain or sea water. It may cause malfunction and sometimes the malfunction cannot be repaired.**

On care

- When the unit will not be used for a long time, periodically turn on the power, operate the camera section and player section and play back a tape for about 3 minutes.
- Clean the lens with a soft brush to remove dust. If there are fingerprints on it, remove them with a soft cloth.
- Clean the camcorder body with a dry, soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent which may damage the finish.

Using your Camcorder Abroad

Each country has its own electricity system and TV colour system. Before using your camcorder abroad, check the following points.

Power Sources

You can use your camcorder in any country with the supplied AC power adaptor within 110 V to 240 V AC, 50/60 Hz.

Differences in colour systems

This camcorder is a PAL system based camcorder. If you want to view the playback picture on a TV, it must be a PAL system based TV or a SECAM system based TV with PAL-SECAM transcoder. Check the following alphabetical list.

PAL system countries
Australia, Austria, Belgium, China, Denmark, Finland, Germany (Former West Germany), Great Britain, Holland, Hong Kong, Italy, Kuwait, Malaysia, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, Thailand, etc.

PAL M system country
Brazil

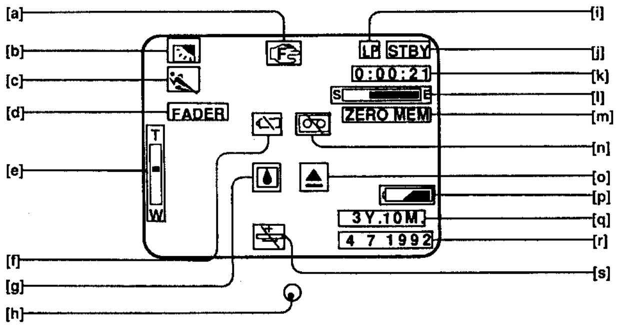
PAL N system countries
Argentina, Paraguay, Uruguay

NTSC system countries
Bahama Islands, Canada, Central America, Japan, Korea, Mexico, Taiwan, The Philippines, U.S.A., etc.

SECAM system countries
Bulgaria, France, Hungary, Iran, Iraq, Monaco, Poland, former Soviet Union, etc.

Indicators in the Viewfinder

(S)



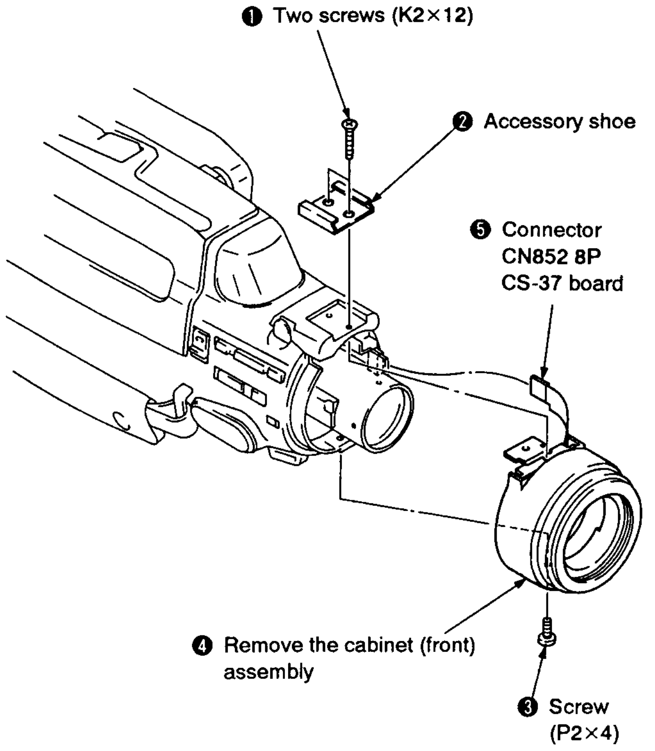
(S)

[a] Focus is maintained
[b] BACK LIGHT is pressed.
[c] PROGRAM AE setting
[d] FADER is pressed.
[e] Power zoom indicator
[f] "Exchange battery."
[g] Moisture has condensed.
[h] Lights up during recording.
When flashing:"Exchange battery or cassette."

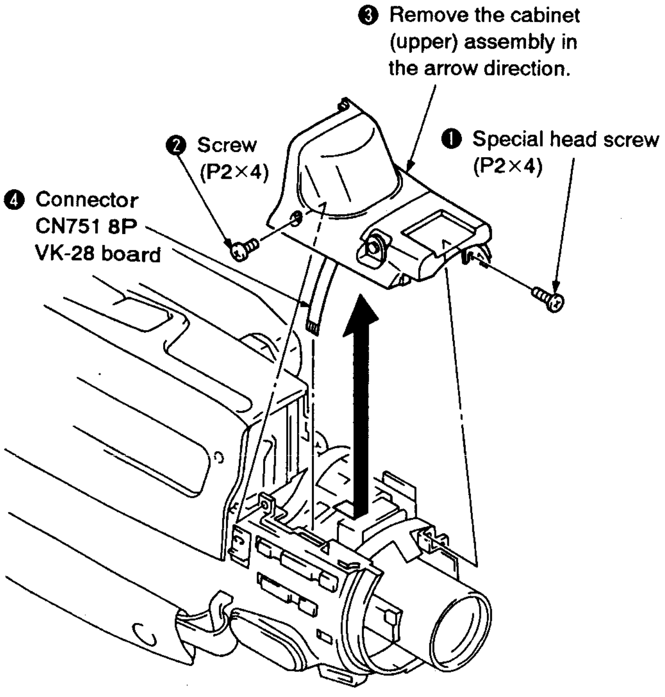
[i] Recording or playback mode (LP,SP)
[j] Tape transport mode
[k] Tape counter
[l] Remaining tape length indicator
[m] ZERO MEM is pressed.
[n] "Exchange cassette or no cassette inside."
[0] "Trouble has occurred" (⏏) "Clean video heads."
[p] Remaining battery capacity indicator
[q] Age
[r] Date or Time
[s] "Replace lithium battery"

SECTION 2
DISASSEMBLY

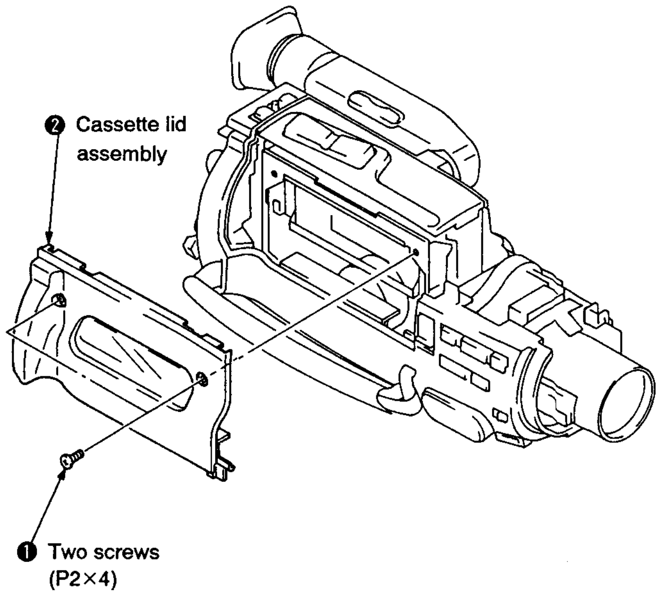
2-1. REMOVAL OF CABINET (FRONT) ASSEMBLY


❶ Two screws (K2×12)
❷ Accessory shoe
❺ Connector CN852 8P CS-37 board
❹ Remove the cabinet (front) assembly
❸ Screw (P2×4)

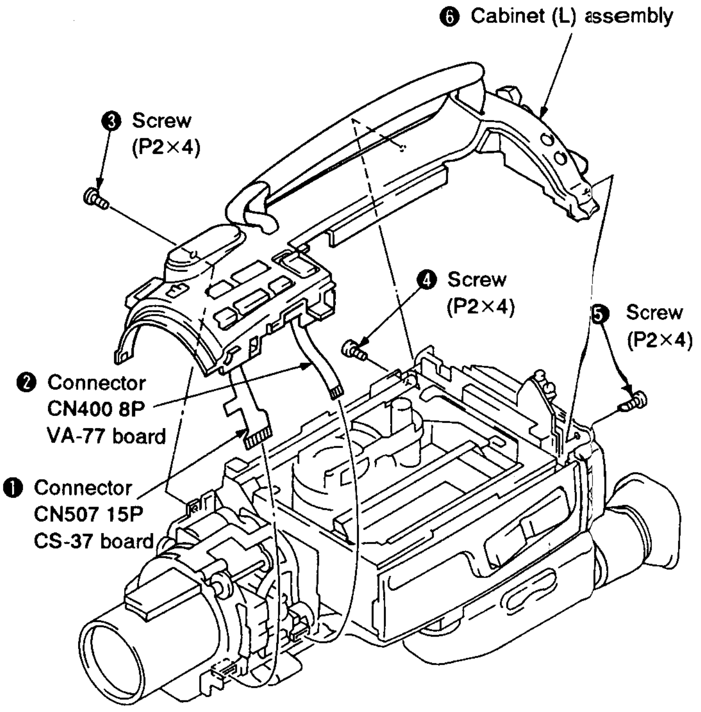
2-2. REMOVAL OF CABINET (UPPER) ASSEMBLY


❸ Remove the cabinet (upper) assembly in the arrow direction.
❷ Screw (P2×4)
❶ Special head screw (P2×4)
❹ Connector CN751 8P VK-28 board

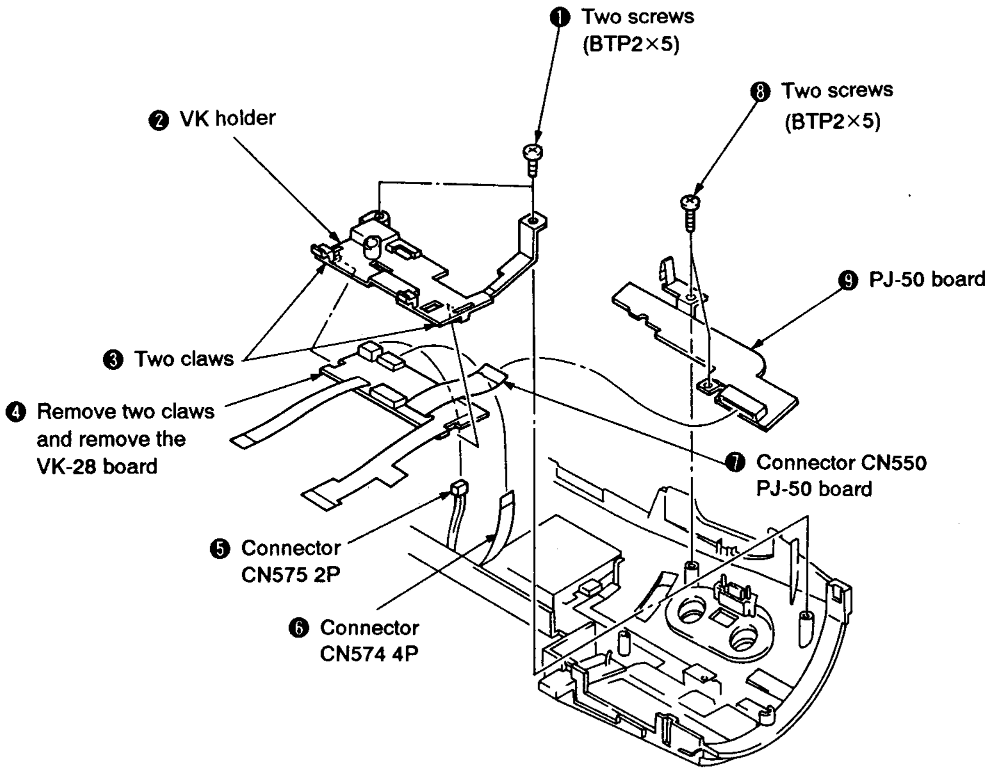
2-3. REMOVAL OF CASSETTE LID ASSEMBLY


❷ Cassette lid assembly
❶ Two screws (P2×4)

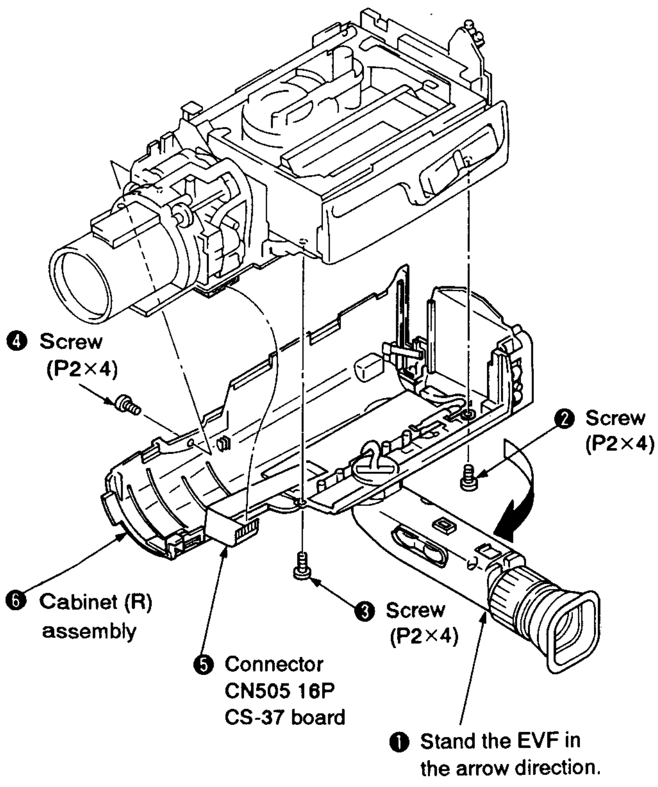
2-4. REMOVAL OF CABINET (L) ASSEMBLY


❻ Cabinet (L) assembly
❸ Screw (P2×4)
❹ Screw (P2×4)
❺ Screw (P2×4)
❷ Connector CN400 8P VA-77 board
❶ Connector CN507 15P CS-37 board

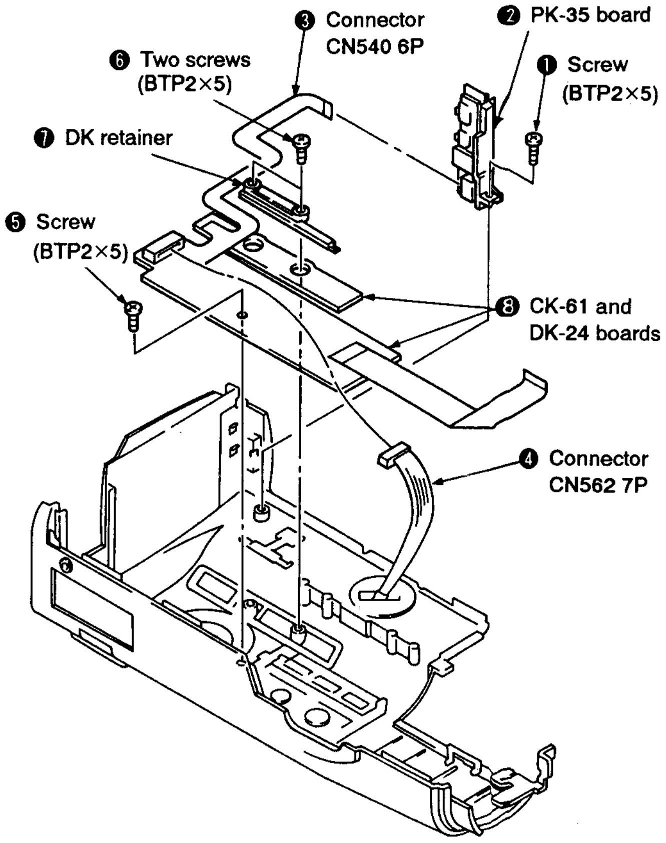
2-5. REMOVAL OF VK-28 AND PJ-50 BOARDS


① Two screws (BTP2×5)
② VK holder
③ Two claws
④ Remove two claws and remove the VK-28 board
⑤ Connector CN575 2P
⑥ Connector CN574 4P
⑦ Connector CN550 PJ-50 board
⑧ Two screws (BTP2×5)
⑨ PJ-50 board

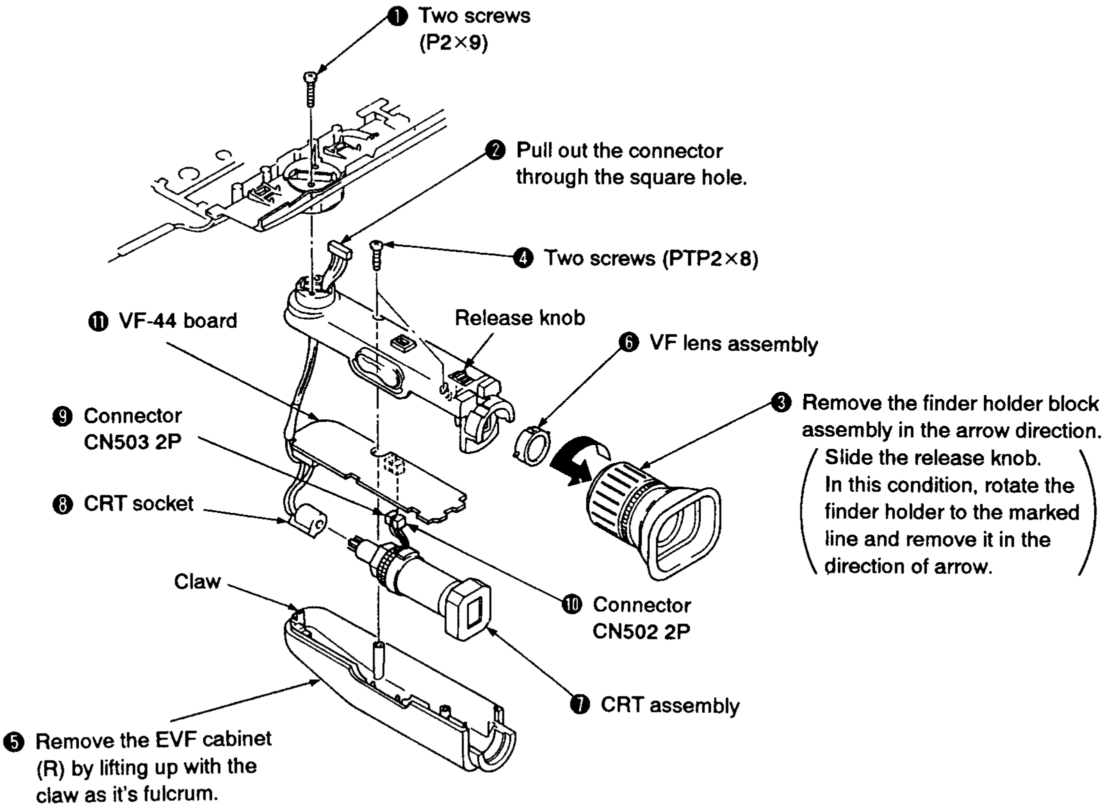
2-6. REMOVAL OF CABINET (R) ASSEMBLY


① Stand the EVF in the arrow direction.
② Screw (P2×4)
③ Screw (P2×4)
④ Screw (P2×4)
⑤ Connector CN505 16P CS-37 board
⑥ Cabinet (R) assembly

2-7. REMOVAL OF CK-61, DK-24 AND PK-35 BOARDS


① Screw (BTP2×5)
② PK-35 board
③ Connector CN540 6P
④ Connector CN562 7P
⑤ Screw (BTP2×5)
⑥ Two screws (BTP2×5)
⑦ DK retainer
⑧ CK-61 and DK-24 boards

2-8. REMOVAL OF EVF ASSEMBLY (VF-44 BOARD)



❶ Two screws (P2×9)

❷ Pull out the connector through the square hole.

❸ Remove the finder holder block assembly in the arrow direction.
(Slide the release knob.
In this condition, rotate the finder holder to the marked line and remove it in the direction of arrow.)

❹ Two screws (PTP2×8)

❺ Remove the EVF cabinet (R) by lifting up with the claw as it's fulcrum.

❻ VF lens assembly

❼ CRT assembly

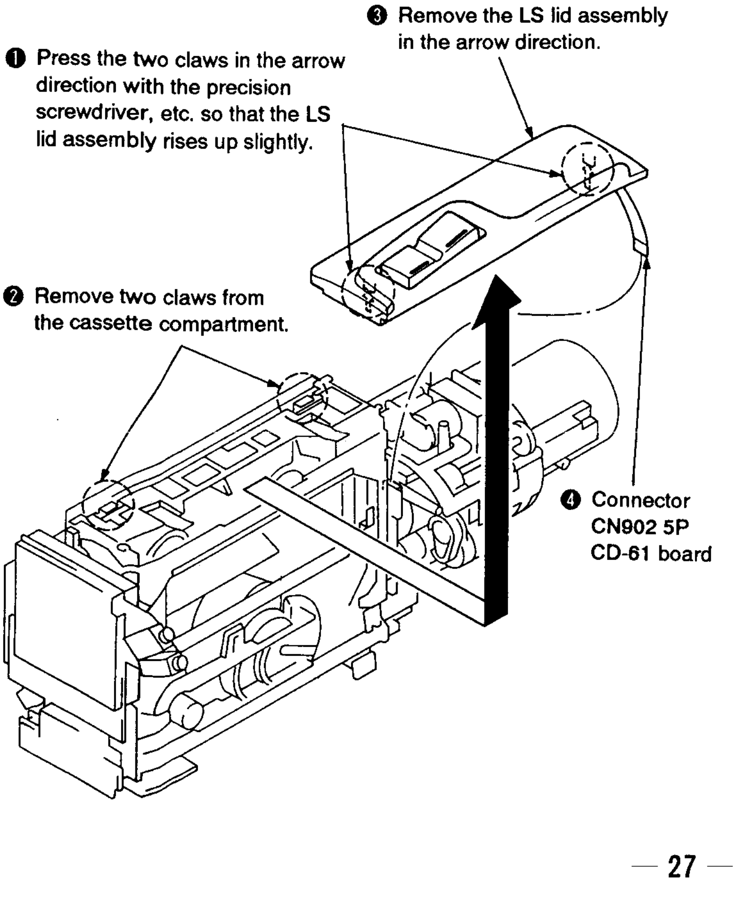
❽ CRT socket

❾ Connector CN503 2P

❿ Connector CN502 2P

⓫ VF-44 board

2-9. REMOVAL OF LS LID ASSEMBLY



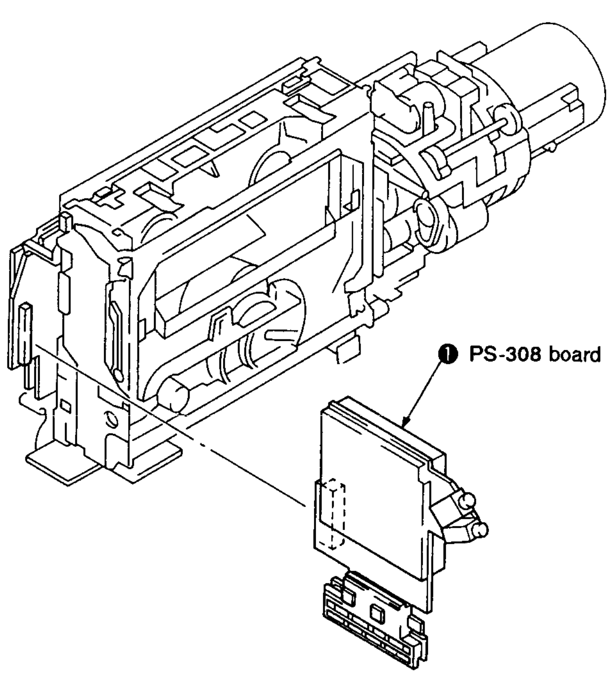
❶ Press the two claws in the arrow direction with the precision screwdriver, etc. so that the LS lid assembly rises up slightly.

❷ Remove two claws from the cassette compartment.

❸ Remove the LS lid assembly in the arrow direction.

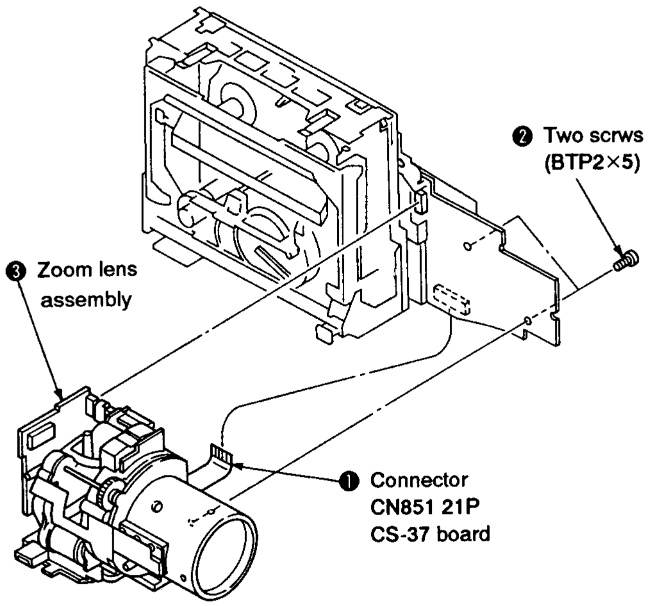
❹ Connector CN902 5P CD-61 board

2-10. REMOVAL OF PS-308 BOARD

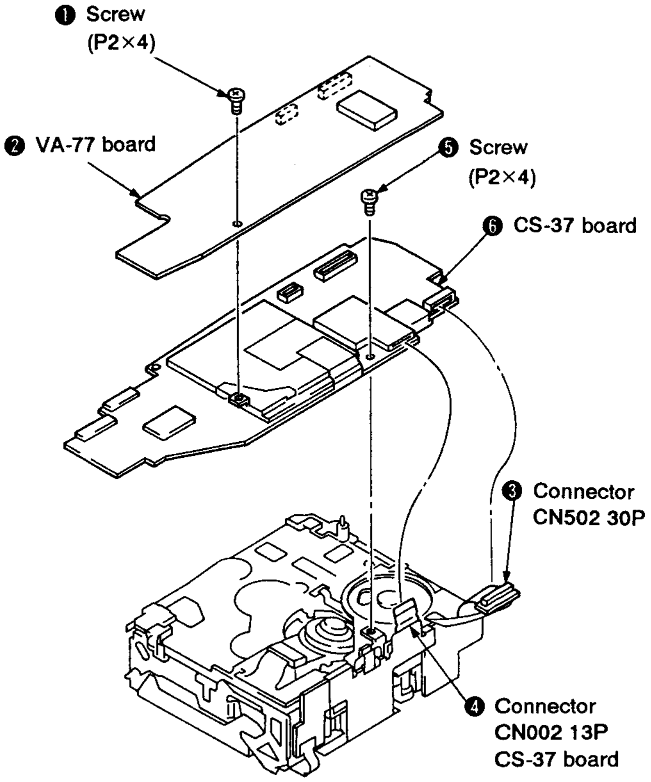


❶ PS-308 board

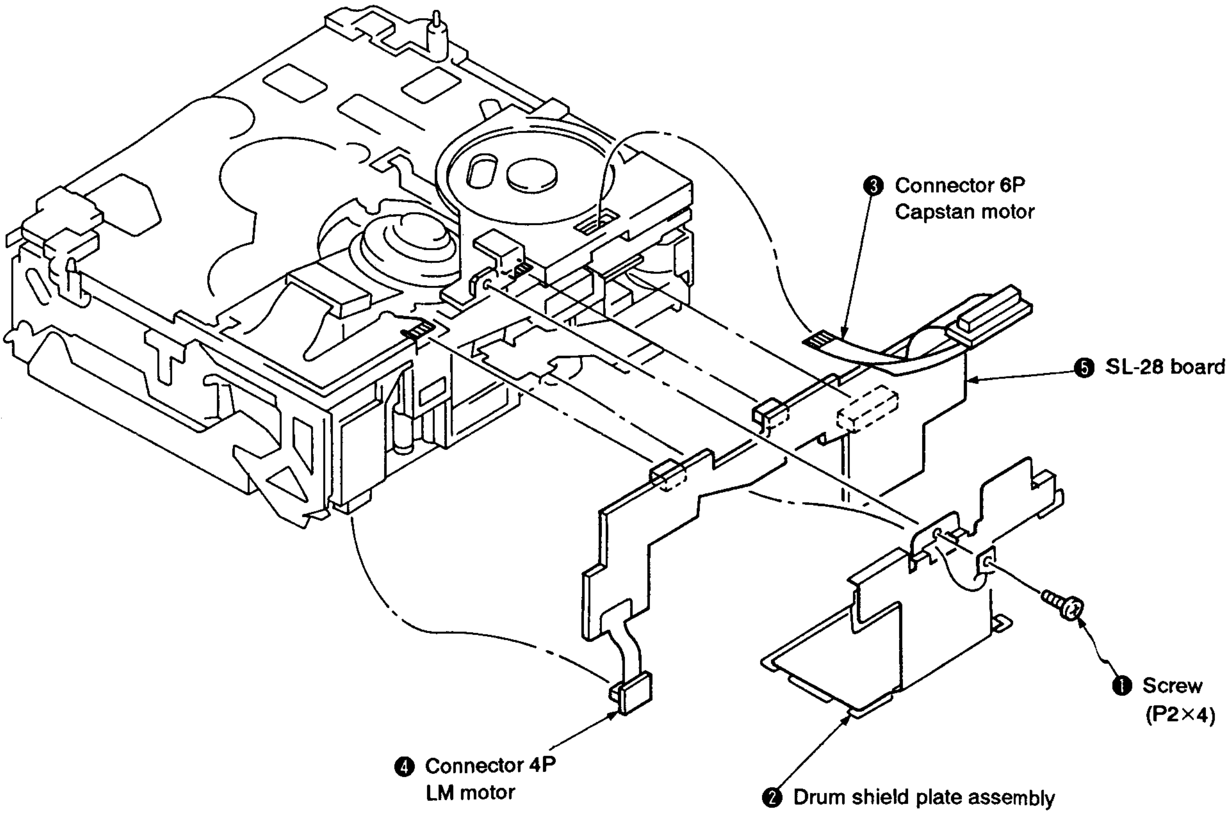
2-11. REMOVAL OF ZOOM LENS ASSEMBLY


❷ Two scrws (BTP2×5)
❸ Zoom lens assembly
❶ Connector CN851 21P CS-37 board

2-12. REMOVAL OF VA-77 AND CS-37 BOARDS

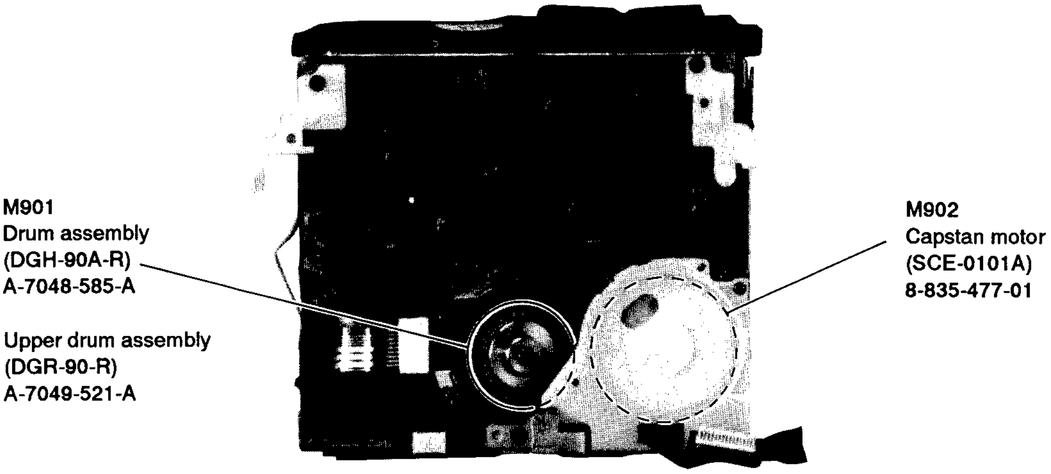

❶ Screw (P2×4)
❷ VA-77 board
❺ Screw (P2×4)
❻ CS-37 board
❸ Connector CN502 30P
❹ Connector CN002 13P CS-37 board

2-13. REMOVAL OF SL-28 BOARD

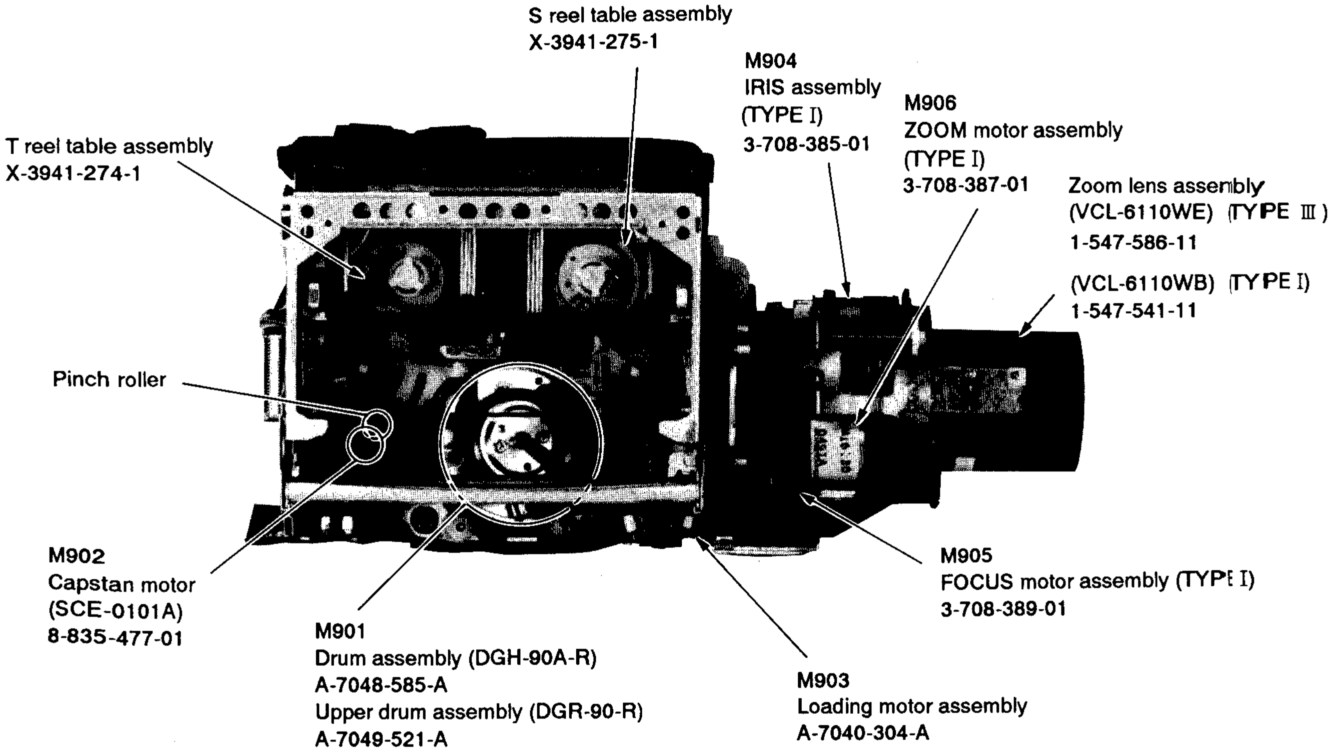

❸ Connector 6P Capstan motor
❺ SL-28 board
❶ Screw (P2×4)
❹ Connector 4P LM motor
❷ Drum shield plate assembly

2-14. INTERNAL VIEWS

— Right side —

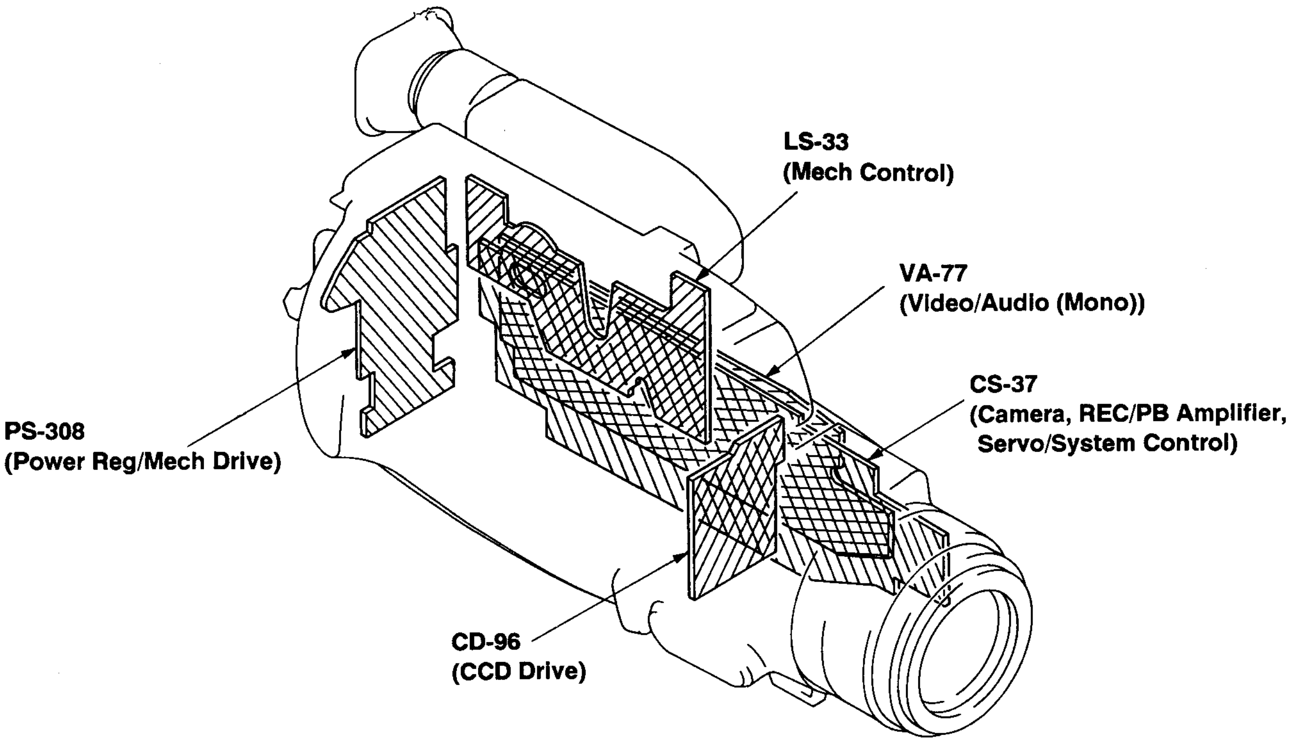

M901
Drum assembly
(DGH-90A-R)
A-7048-585-A
Upper drum assembly
(DGR-90-R)
A-7049-521-A
M902
Capstan motor
(SCE-0101A)
8-835-477-01

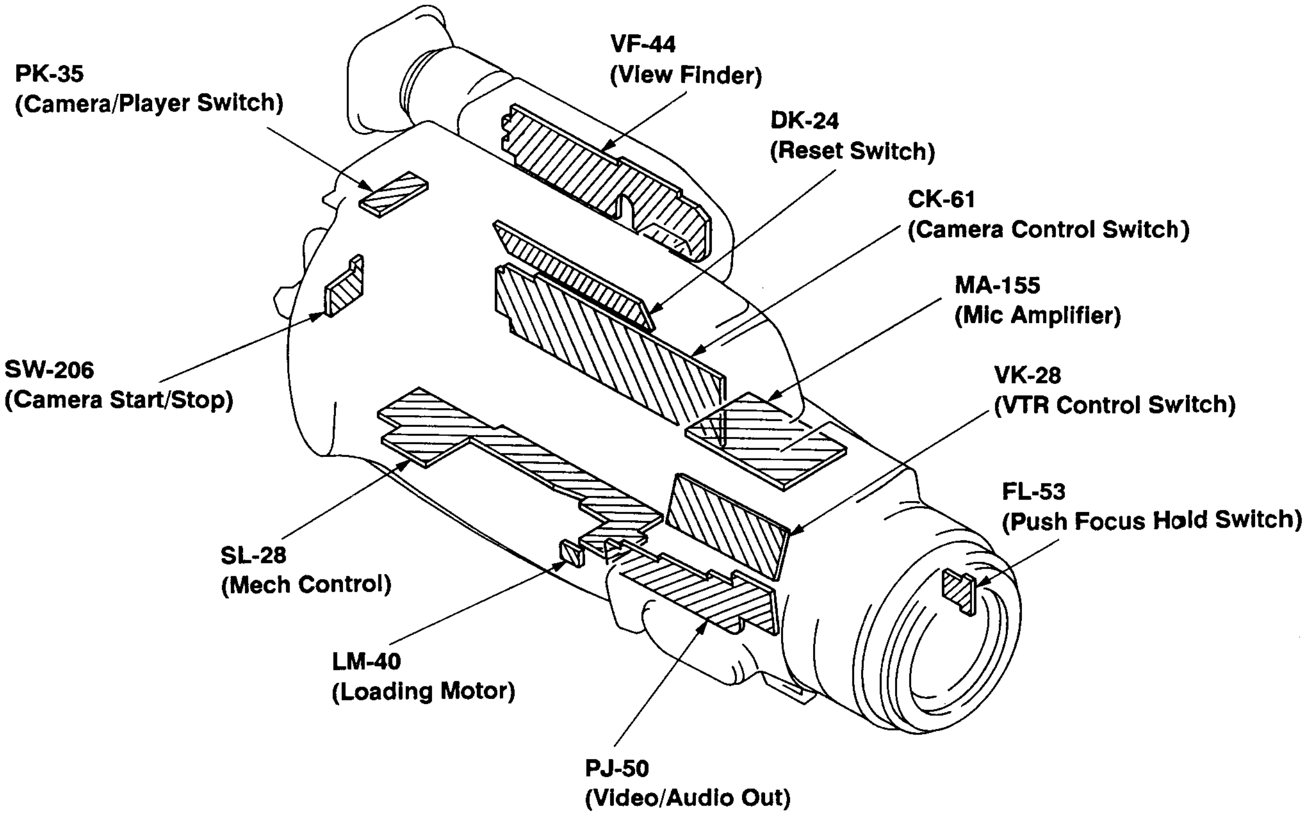
— Left side —


S reel table assembly
X-3941-275-1
M904
IRIS assembly
(TYPE I)
3-708-385-01
M906
ZOOM motor assembly
(TYPE I)
3-708-387-01
T reel table assembly
X-3941-274-1
Zoom lens assembly
(VCL-6110WE) (TYPE Ⅲ)
1-547-586-11
(VCL-6110WB) (TYPE I)
1-547-541-11
Pinch roller
M902
Capstan motor
(SCE-0101A)
8-835-477-01
M901
Drum assembly (DGH-90A-R)
A-7048-585-A
Upper drum assembly (DGR-90-R)
A-7049-521-A
M905
FOCUS motor assembly (TYPE I)
3-708-389-01
M903
Loading motor assembly
A-7040-304-A

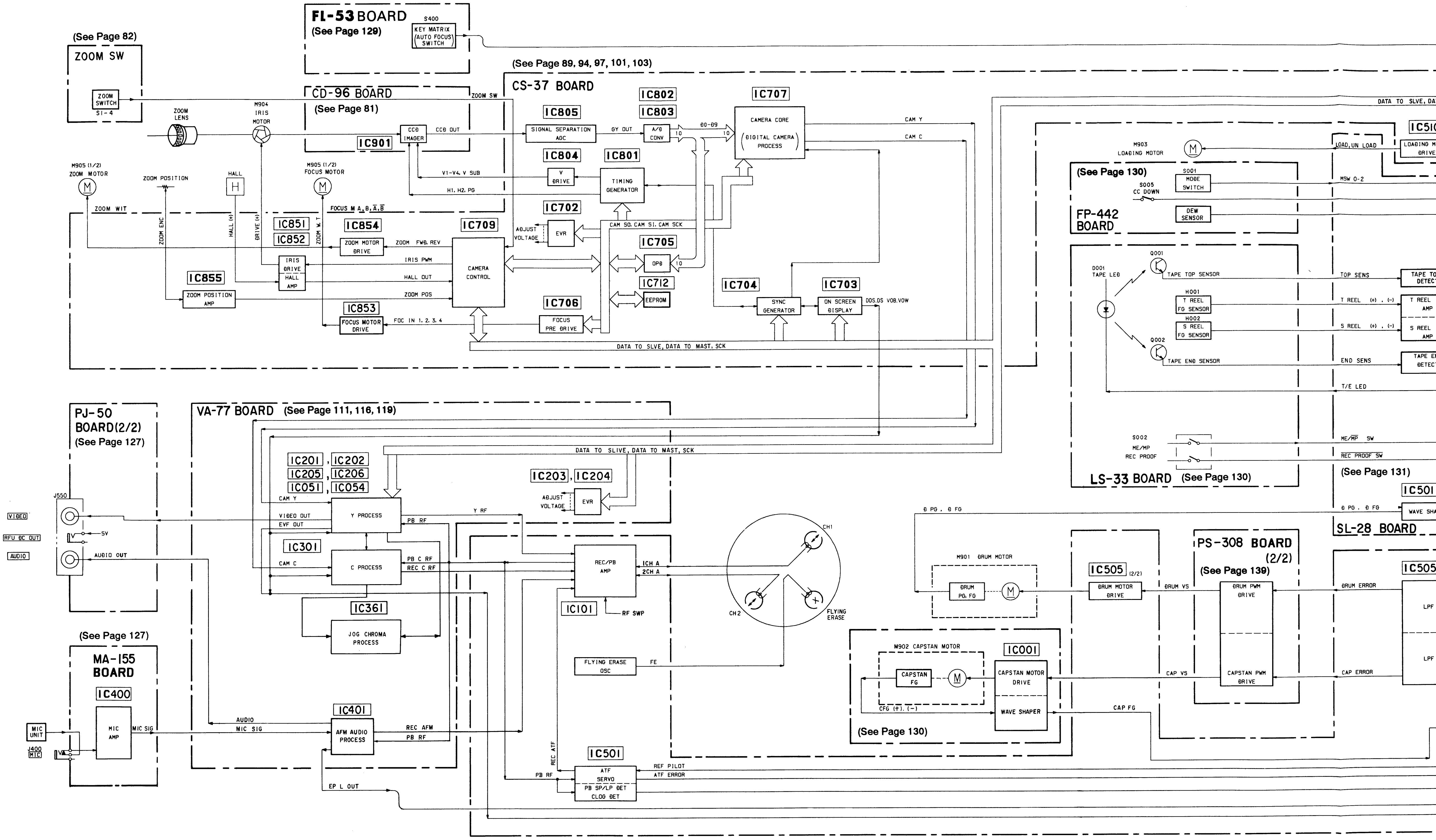
SECTION 3
DIAGRAMS

3-1. CIRCUIT BOARDS LOCATION

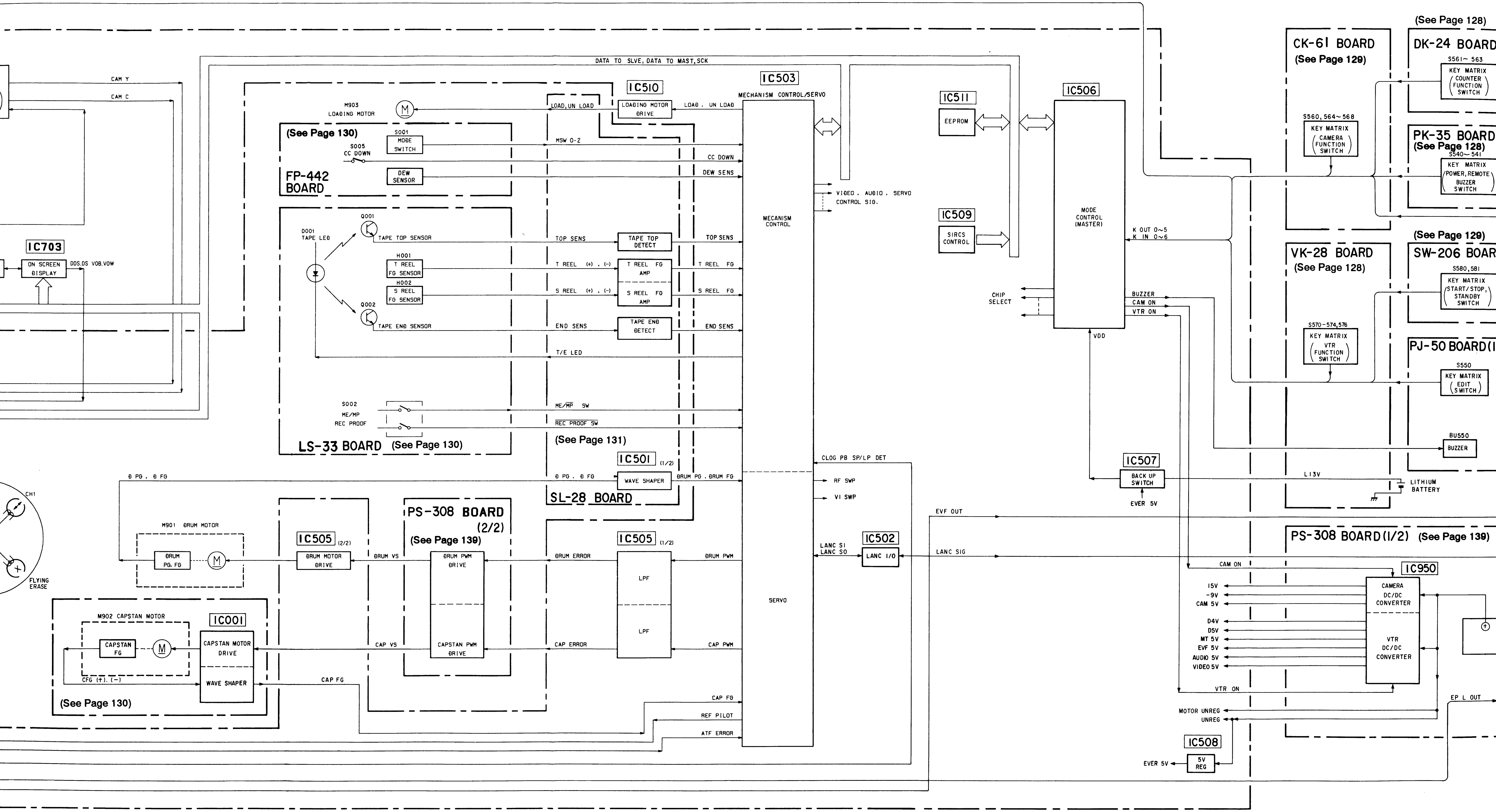

LS-33
(Mech Control)
VA-77
(Video/Audio (Mono))
CS-37
(Camera, REC/PB Amplifier,
Servo/System Control)
PS-308
(Power Reg/Mech Drive)
CD-96
(CCD Drive)

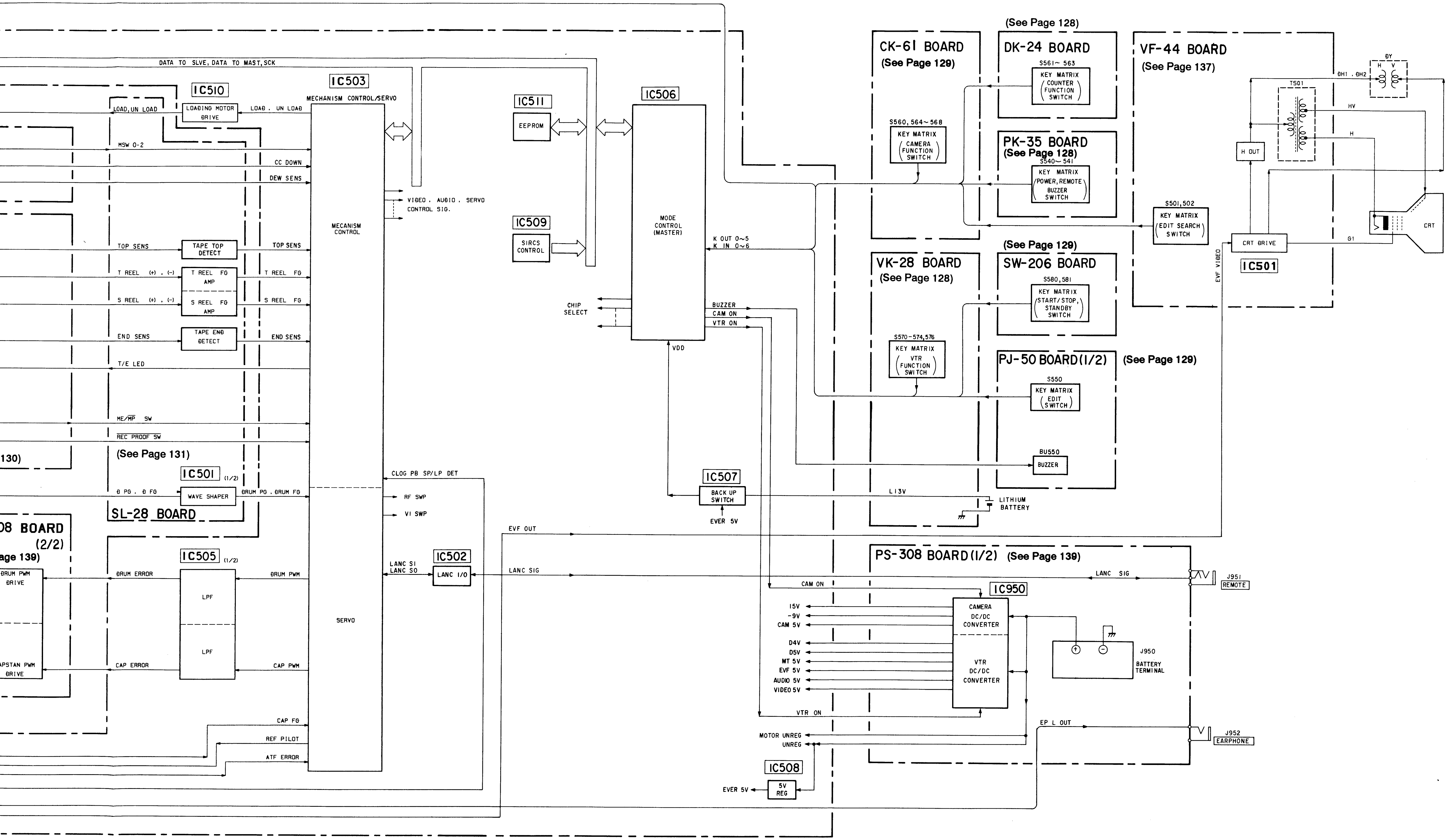

VF-44
(View Finder)
PK-35
(Camera/Player Switch)
DK-24
(Reset Switch)
CK-61
(Camera Control Switch)
MA-155
(Mic Amplifier)
SW-206
(Camera Start/Stop)
VK-28
(VTR Control Switch)
FL-53
(Push Focus Hold Switch)
SL-28
(Mech Control)
LM-40
(Loading Motor)
PJ-50
(Video/Audio Out)

3-2. OVERALL BLOCK DIAGRAM

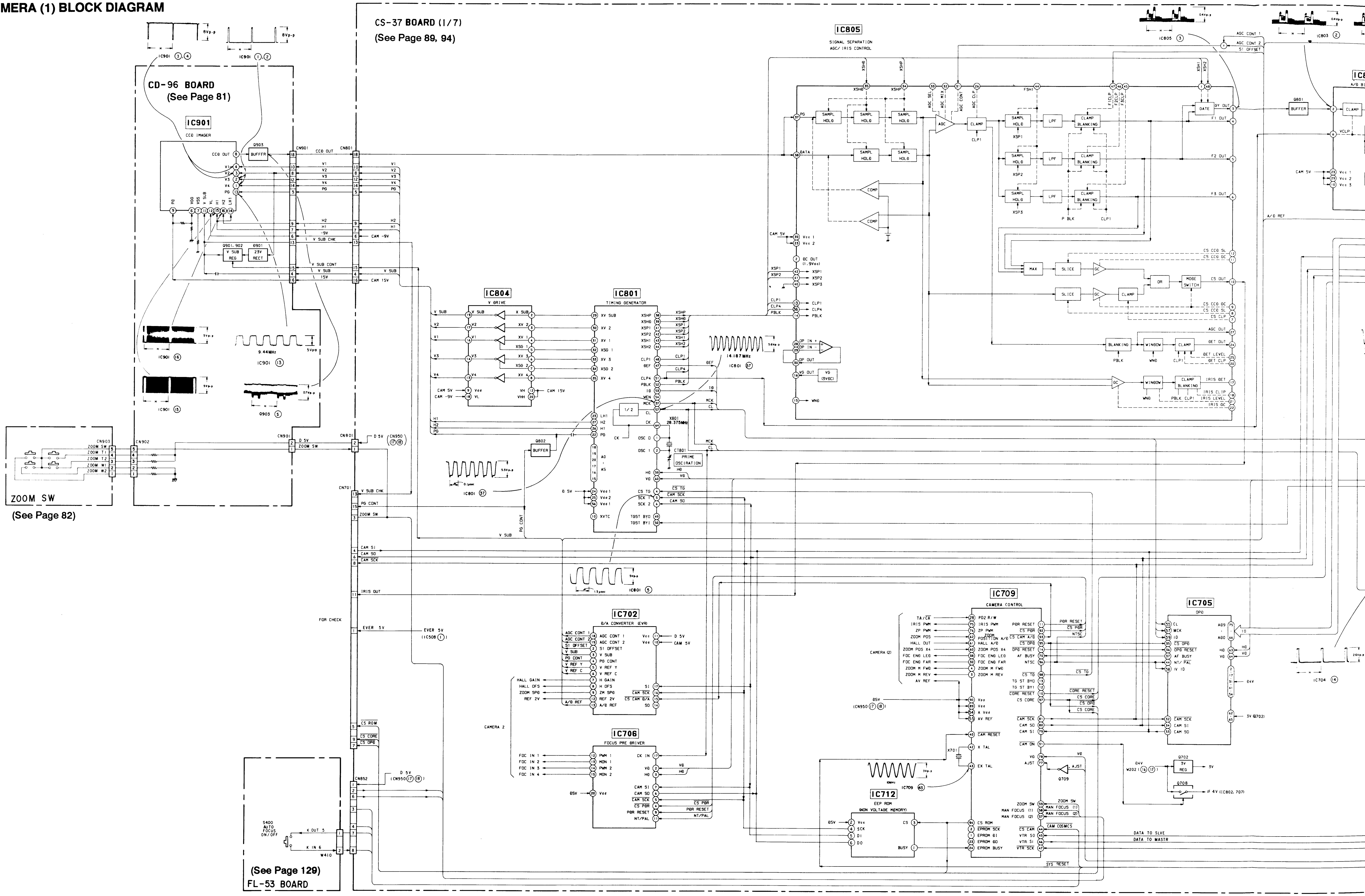


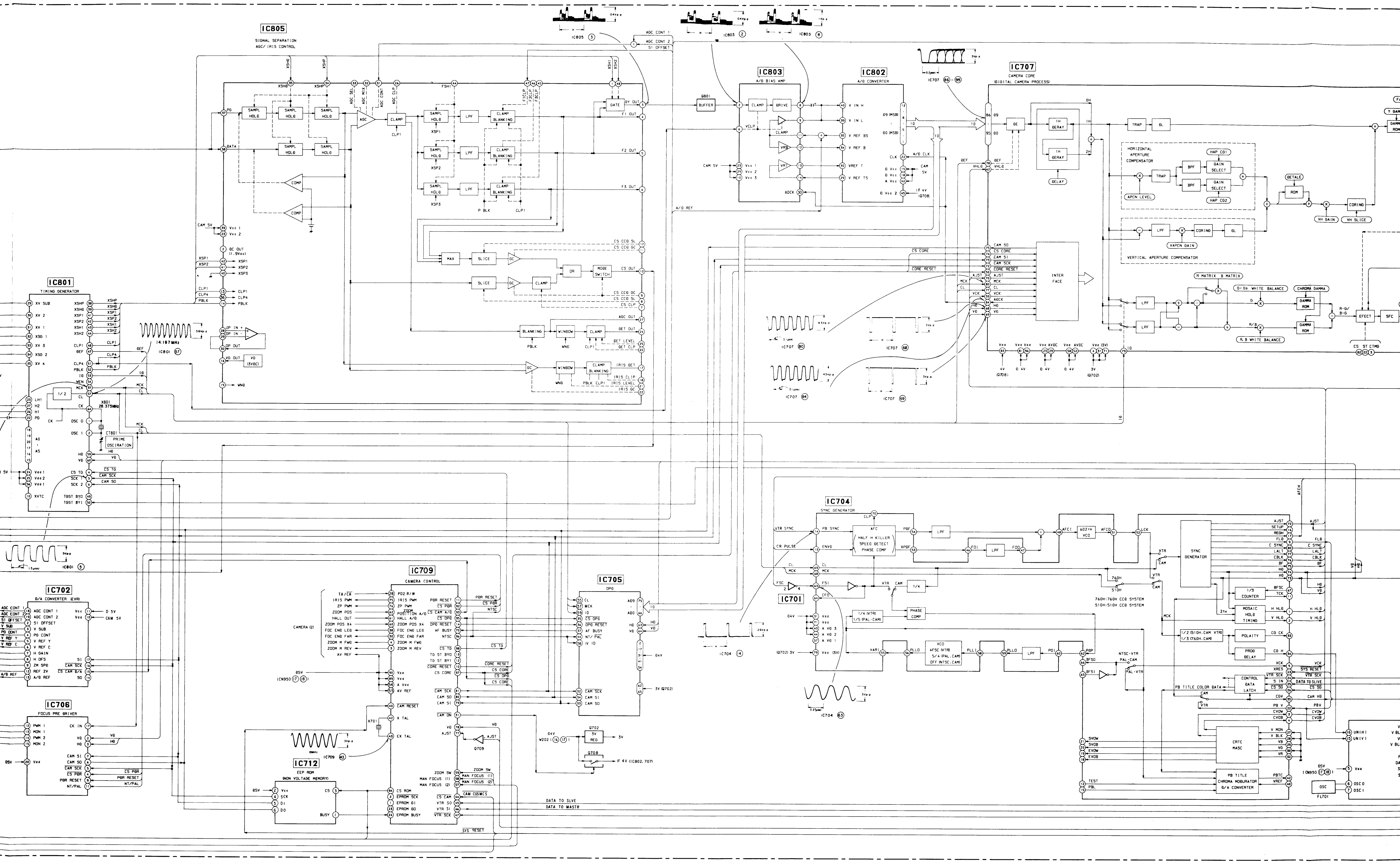
FL-53 BOARD
(See Page 129)
S400
KEY MATRIX (AUTO FOCUS SWITCH)
(See Page 82)
ZOOM SW
ZOOM SWITCH S1-4
ZOOM LENS
M904 IRIS MOTOR
CD-96 BOARD
(See Page 81)
CCD IMAGER
CCD OUT
IC901
ZOOM SW
(See Page 89, 94, 97, 101, 103)
CS-37 BOARD
IC805
SIGNAL SEPARATION AGC
GY OUT
IC802
IC803
A/D CONV
D0-D9
10
IC707
CAMERA CORE (DIGITAL CAMERA PROCESS)
CAM Y
CAM C
DATA TO SLVE, DA
M905 (1/2) ZOOM MOTOR
ZOOM POSITION
HALL
M905 (1/2) FOCUS MOTOR
IC804
V DRIVE
IC801
TIMING GENERATOR
V1-V4, V SUB
H1, H2, PG
FOCUS M A, B, A, B
ZOOM WIT
ZOOM ENC
HALL (+)
DRIVE (+)
ZOOM W.T
IC851
IC852
IC854
ZOOM MOTOR DRIVE
ZOOM FWD, REV
IC709
CAMERA CONTROL
IC702
ADJUST VOLTAGE
EVR
CAM SO, CAM SI, CAM SCK
IC705
OPD
IRIS DRIVE
HALL AMP
IRIS PWM
HALL OUT
IC712
EEPROM
IC855
ZOOM POSITION AMP
ZOOM POS
IC704
SYNC GENERATOR
IC703
ON SCREEN DISPLAY
DDS, DS VOB, VOW
IC853
FOCUS MOTOR DRIVE
FOC IN 1, 2, 3, 4
IC706
FOCUS PRE DRIVE
DATA TO SLVE, DATA TO MAST, SCK
M903 LOADING MOTOR
LOAD, UN LOAD
IC510
LOADING M DRIVE
(See Page 130)
S001 MODE SWITCH
S005 CC DOWN
MSW 0-2
FP-442 BOARD
DEW SENSOR
D001 TAPE LED
Q001
TAPE TOP SENSOR
TOP SENS
TAPE TO DETEC
H001 T REEL FG SENSOR
T REEL (+), (-)
T REEL AMP
H002 S REEL FG SENSOR
S REEL (+), (-)
S REEL AMP
Q002
TAPE END SENSOR
END SENS
TAPE E DETEC
T/E LED
S002 ME/MP REC PROOF
ME/MP SW
REC PROOF SW
LS-33 BOARD (See Page 130)
(See Page 131)
IC501
D PG, D FG
WAVE SHA
SL-28 BOARD
PJ-50 BOARD (2/2)
(See Page 127)
VA-77 BOARD (See Page 111, 116, 119)
DATA TO SLIVE, DATA TO MAST, SCK
IC201, IC202
IC205, IC206
IC051, IC054
IC203, IC204
ADJUST VOLTAGE
EVR
J550
VIDEO
RFU DC OUT
AUDIO
5V
AUDIO OUT
CAM Y
VIDEO OUT
EVF OUT
Y PROCESS
Y RF
PB RF
IC301
CAM C
C PROCESS
PB C RF
REC C RF
REC/PB AMP
1CH A
2CH A
IC101
RF SWP
CH1
CH2
FLYING ERASE
IC361
JOG CHROMA PROCESS
(See Page 127)
MA-155 BOARD
IC400
MIC AMP
MIC SIG
MIC UNIT
J400 MIC
AUDIO
MIC SIG
IC401
AFM AUDIO PROCESS
REC AFM
PB RF
FLYING ERASE OSC
FE
REC ATF
IC501
ATF SERVO
PB SP/LP DET
CLOG DET
REF PILOT
ATF ERROR
PB RF
EP L OUT
M901 DRUM MOTOR
DRUM PG, FG
IC505 (2/2)
DRUM MOTOR DRIVE
DRUM VS
PS-308 BOARD (2/2)
(See Page 139)
DRUM PWM DRIVE
DRUM ERROR
IC505
LPF
M902 CAPSTAN MOTOR
CAPSTAN FG
IC001
CAPSTAN MOTOR DRIVE
WAVE SHAPER
CFG (+), (-)
CAP VS
CAPSTAN PWM DRIVE
CAP ERROR
CAP FG
(See Page 130)

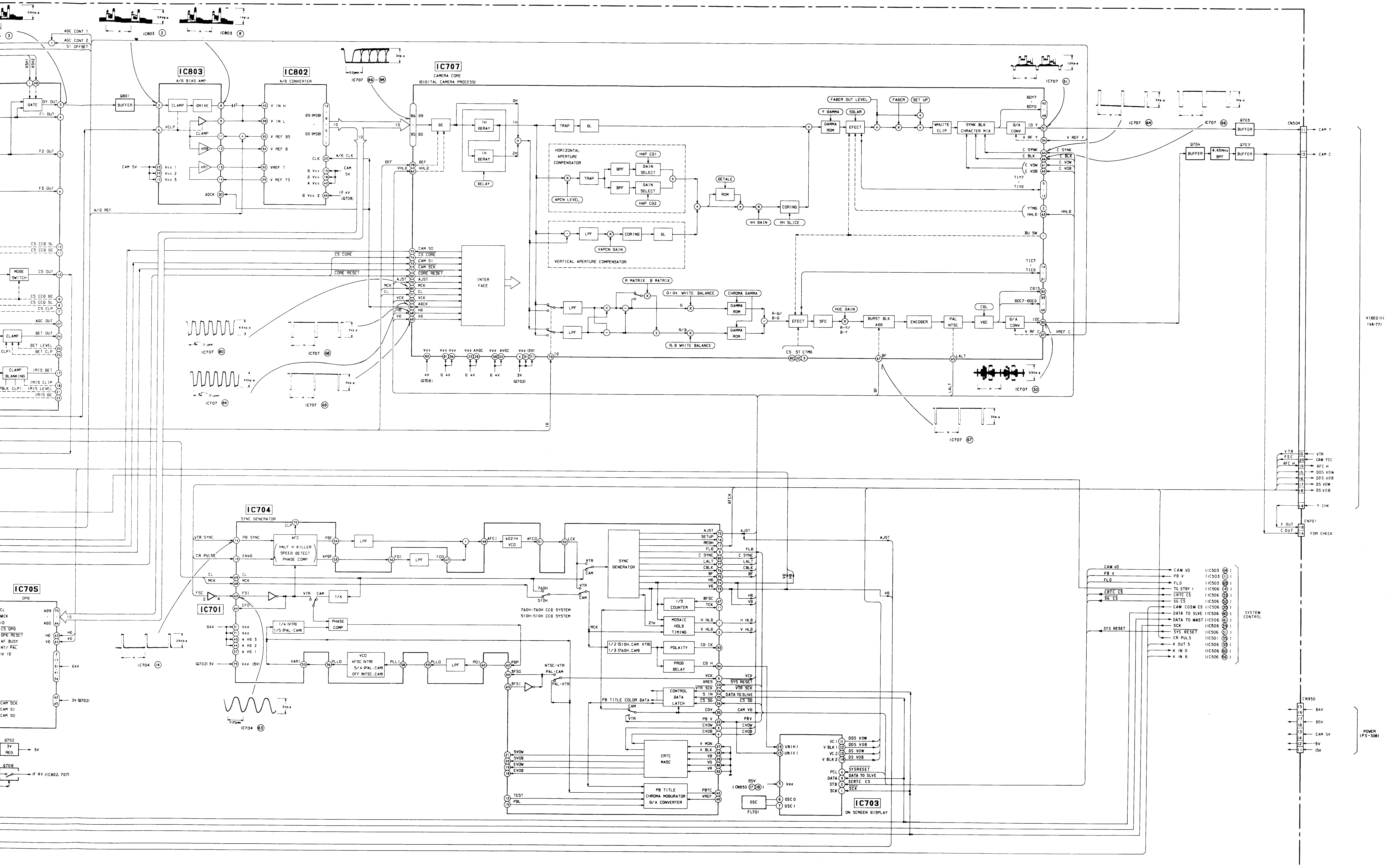

CAM Y
CAM C
IC703
ON SCREEN DISPLAY
DDS.DS VOB.VOW
DATA TO SLVE, DATA TO MAST, SCK
M903 LOADING MOTOR
IC510
LOADING MOTOR DRIVE
LOAD, UN LOAD
LOAD . UN LOAD
IC503
MECHANISM CONTROL/SERVO
(See Page 130)
S001 MODE SWITCH
S005 CC DOWN
DEW SENSOR
FP-442 BOARD
MSW 0-2
CC DOWN
DEW SENS
MECANISM CONTROL
VIDEO . AUDIO . SERVO CONTROL SIG.
D001 TAPE LED
Q001
TAPE TOP SENSOR
H001 T REEL FG SENSOR
H002 S REEL FG SENSOR
Q002
TAPE END SENSOR
TOP SENS
TAPE TOP DETECT
T REEL (+) . (-)
T REEL FG AMP
T REEL FG
S REEL (+) . (-)
S REEL FG AMP
S REEL FG
END SENS
TAPE END DETECT
T/E LED
S002 ME/MP REC PROOF
ME/MP SW
REC PROOF SW
LS-33 BOARD (See Page 130)
(See Page 131)
IC501 (1/2)
WAVE SHAPER
D PG . D FG
DRUM PG . DRUM FG
SL-28 BOARD
CH1
FLYING ERASE
M901 DRUM MOTOR
DRUM PG. FG
IC505 (2/2)
DRUM MOTOR DRIVE
DRUM VS
PS-308 BOARD (2/2)
(See Page 139)
DRUM PWM DRIVE
DRUM ERROR
IC505 (1/2)
LPF
LPF
DRUM PWM
M902 CAPSTAN MOTOR
CAPSTAN FG
IC001
CAPSTAN MOTOR DRIVE
WAVE SHAPER
CFG (+). (-)
(See Page 130)
CAP VS
CAPSTAN PWM DRIVE
CAP ERROR
CAP PWM
CAP FG
CAP FG
REF PILOT
ATF ERROR
SERVO
CLOG PB SP/LP DET
RF SWP
VI SWP
LANC SI
LANC SO
IC502
LANC I/O
LANC SIG
EVF OUT
IC511
EEPROM
IC509
SIRCS CONTROL
CHIP SELECT
IC506
MODE CONTROL (MASTER)
K OUT 0~5
K IN 0~6
BUZZER
CAM ON
VTR ON
VDD
IC507
BACK UP SWITCH
EVER 5V
L13V
LITHIUM BATTERY
CK-61 BOARD
(See Page 129)
S560, 564~568
KEY MATRIX (CAMERA FUNCTION SWITCH)
(See Page 128)
DK-24 BOARD
S561~563
KEY MATRIX (COUNTER FUNCTION SWITCH)
PK-35 BOARD
(See Page 128)
S540~541
KEY MATRIX (POWER, REMOTE BUZZER SWITCH)
VK-28 BOARD
(See Page 128)
S570~574, 576
KEY MATRIX (VTR FUNCTION SWITCH)
(See Page 129)
SW-206 BOAR
S580, 581
KEY MATRIX (START/STOP, STANDBY SWITCH)
PJ-50 BOARD(I
S550
KEY MATRIX (EDIT SWITCH)
BU550
BUZZER
PS-308 BOARD (1/2) (See Page 139)
CAM ON
IC950
CAMERA DC/DC CONVERTER
15V
-9V
CAM 5V
D4V
D5V
MT 5V
EVF 5V
AUDIO 5V
VIDEO 5V
VTR DC/DC CONVERTER
VTR ON
MOTOR UNREG
UNREG
EP L OUT
IC508
5V REG
EVER 5V


DATA TO SLVE, DATA TO MAST, SCK
IC510
LOADING MOTOR DRIVE
LOAD, UN LOAD
LOAD . UN LOAD
IC503
MECHANISM CONTROL/SERVO
MECANISM CONTROL
SERVO
MSW 0-2
CC DOWN
DEW SENS
TOP SENS
TAPE TOP DETECT
T REEL (+) . (-)
T REEL FG AMP
T REEL FG
S REEL (+) . (-)
S REEL FG AMP
S REEL FG
END SENS
TAPE END DETECT
T/E LED
ME/MP SW
REC PROOF SW
(See Page 131)
130)
IC501 (1/2)
WAVE SHAPER
D PG . D FG
DRUM PG . DRUM FG
SL-28 BOARD
08 BOARD (2/2)
age 139)
DRUM PWM DRIVE
APSTAN PWM DRIVE
IC505 (1/2)
LPF
LPF
DRUM ERROR
DRUM PWM
CAP ERROR
CAP PWM
CAP FG
REF PILOT
ATF ERROR
CLOG PB SP/LP DET
RF SWP
VI SWP
VIDEO . AUDIO . SERVO CONTROL SIG.
IC511
EEPROM
IC509
SIRCS CONTROL
IC506
MODE CONTROL (MASTER)
CHIP SELECT
K OUT 0~5
K IN 0~6
BUZZER
CAM ON
VTR ON
VDD
IC507
BACK UP SWITCH
EVER 5V
L13V
LITHIUM BATTERY
EVF OUT
LANC SI
LANC SO
IC502
LANC I/O
LANC SIG
CK-61 BOARD
(See Page 129)
S560, 564~568
KEY MATRIX
CAMERA FUNCTION SWITCH
(See Page 128)
DK-24 BOARD
S561~563
KEY MATRIX
COUNTER FUNCTION SWITCH
PK-35 BOARD
(See Page 128)
S540~541
KEY MATRIX
POWER, REMOTE BUZZER SWITCH
VK-28 BOARD
(See Page 128)
S570~574, 576
KEY MATRIX
VTR FUNCTION SWITCH
(See Page 129)
SW-206 BOARD
S580, 581
KEY MATRIX
START/STOP, STANDBY SWITCH
PJ-50 BOARD (1/2)
(See Page 129)
S550
KEY MATRIX
EDIT SWITCH
BU550
BUZZER
VF-44 BOARD
(See Page 137)
S501, 502
KEY MATRIX
EDIT SEARCH SWITCH
DY
H
V
DH1 . DH2
T501
HV
H
H OUT
CRT DRIVE
IC501
G1
CRT
EVF VIDEO
PS-308 BOARD (1/2)
(See Page 139)
LANC SIG
J951
REMOTE
CAM ON
IC950
CAMERA DC/DC CONVERTER
VTR DC/DC CONVERTER
15V
-9V
CAM 5V
D4V
D5V
MT 5V
EVF 5V
AUDIO 5V
VIDEO 5V
VTR ON
J950
BATTERY TERMINAL
EP L OUT
J952
EARPHONE
MOTOR UNREG
UNREG
IC508
5V REG
EVER 5V

3-3. CAMERA (1) BLOCK DIAGRAM


CS-37 BOARD (1/7)
(See Page 89, 94)
CD-96 BOARD
(See Page 81)
IC901
CCD IMAGER
Q903
BUFFER
CN901
CN801
CCD OUT
V1
V2
V3
V4
PG
H2
H1
-9V
V SUB CHK
V SUB CONT
V SUB
15V
CAM -9V
CAM 15V
Q901, 902
V SUB REG
Q901
23V RECT
8Vp-p
IC901 ③④
IC901 ①②
IC901 ⑯
IC901 ⑬
9.44MHz
IC901 ⑮
Q903 ⑤
ZOOM SW
(See Page 82)
CN903
CN902
ZOOM SW
ZOOM T1
ZOOM T2
ZOOM W1
ZOOM W2
D 5V
CN950 ⑰⑱
IC805
SIGNAL SEPARATION
AGC/IRIS CONTROL
SAMPL HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
COMP
GATE
MAX
SLICE
GC
OR
MODE SWITCH
BLANKING
WINDOW
F1 OUT
F2 OUT
F3 OUT
SY OUT
AGC CONT 1
AGC CONT 2
S1 OFFSET
A/D REF
IC805 ③
IC803 ②
Q801
BUFFER
IC804
V DRIVE
IC801
TIMING GENERATOR
1/2
X801
28.375MHz
OSC 0
OSC 1
CT801
PRIME OSCIRATION
14.187MHz
IC801 57
Q802
BUFFER
IC801 37
IC801 ⑤
CN701
V SUB CHK
PG CONT
ZOOM SW
CAM SI
CAM SO
CAM SCK
IRIS OUT
FOR CHECK
EVER 5V
EVER 5V (IC508 ①)
CS ROM
CS CORE
CS OPD
IC702
D/A CONVERTER (EVR)
HALL GAIN
HALL OFS
ZOOM SPD
REF 2V
CAMERA 2
IC706
FOCUS PRE DRIVER
FOC IN 1
FOC IN 2
FOC IN 3
FOC IN 4
IC709
CAMERA CONTROL
CAMERA (2)
IC712
EEP ROM
(NON VOLTAGE MEMORY)
IC709 43
X701
Q709
IC705
OPD
IC704 ④
Q702
3V REG
Q708
4V (IC802, 707)
DATA TO SLVE
DATA TO MASTR
SYS RESET
CN852
S400
AUTO FOCUS ON/OFF
K OUT 5
K IN 6
W410
(See Page 129)
FL-53 BOARD


IC805
SIGNAL SEPARATION
AGC/IRIS CONTROL
IC801
TIMING GENERATOR
IC803
A/D BIAS AMP
IC802
A/D CONVERTER
IC707
CAMERA CORE
(DIGITAL CAMERA PROCESS)
HORIZONTAL APERTURE COMPENSATOR
VERTICAL APERTURE COMPENSATOR
INTER FACE
R MATRIX B MATRIX
R/B WHITE BALANCE
CHROMA GAMMA
IC702
D/A CONVERTER (EVR)
IC706
FOCUS PRE DRIVER
IC709
CAMERA CONTROL
IC712
EEP ROM
(NON VOLTAGE MEMORY)
IC705
OPD
IC704
SYNC GENERATOR
IC701
SYNC GENERATOR
PB TITLE CHROMA MODURATOR D/A CONVERTER
CRTC MASC
Q702
3V REG
Q708
Q709
Q801
BUFFER
X701
X801
20.375MHz
CT801
PRIME OSCIRATION
FL701
OSC
760H:760H CCD SYSTEM
510H:510H CCD SYSTEM
DATA TO SLVE
DATA TO MASTR
SYS RESET
14.187MHz
IC801 ⑤
IC805 ③
IC803 ②
IC803 ⑧
IC707 (80)
IC707 (84)
IC707 (68)
IC707 (69)
IC704 ⑭
IC704 (63)
IC709 (43)

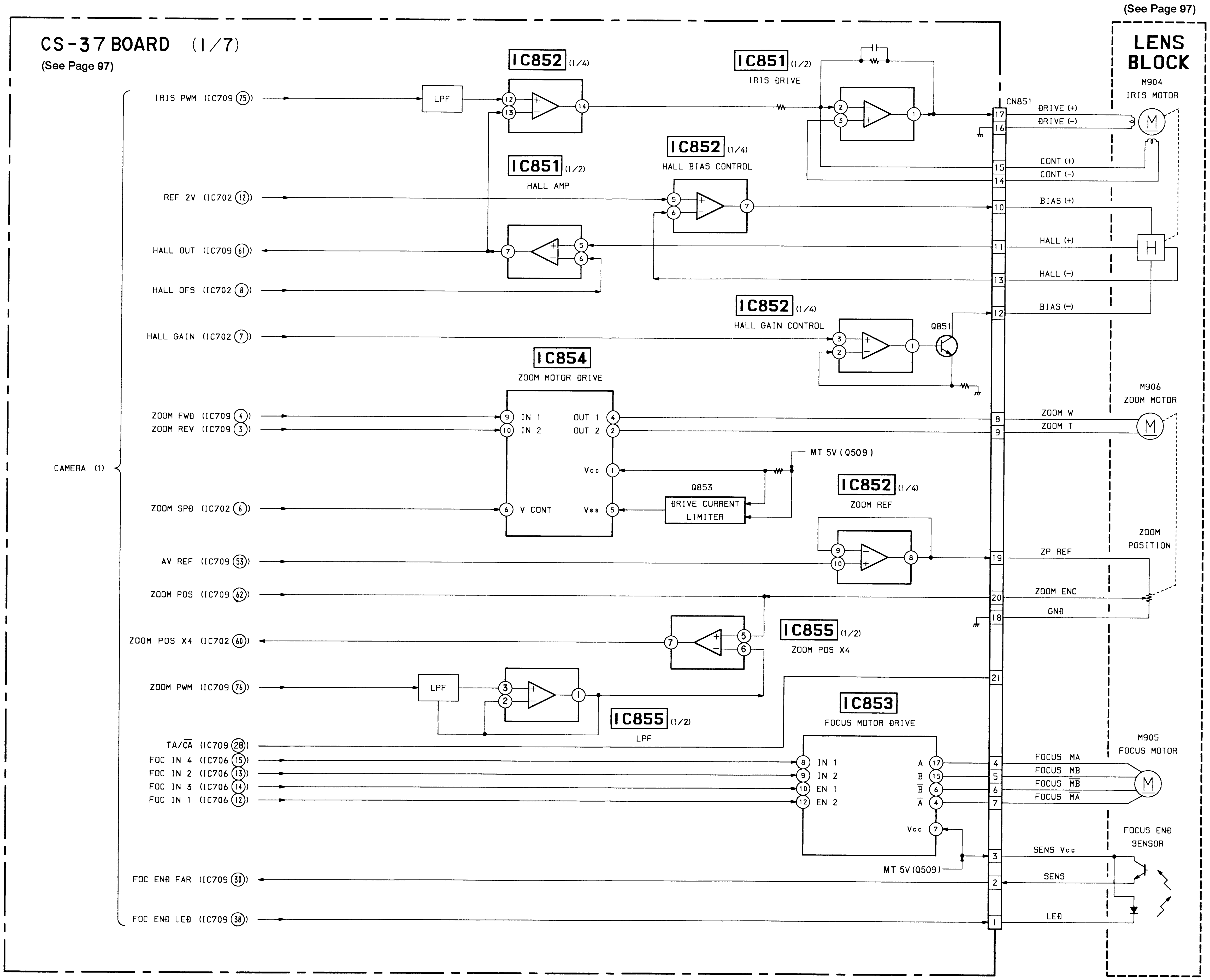

IC803
A/D BIAS AMP
IC802
A/D CONVERTER
IC707
CAMERA CORE
(DIGITAL CAMERA PROCESS)
IC704
SYNC GENERATOR
IC705
DPO
IC701
IC703
ON SCREEN DISPLAY
BUFFER
CLAMP
DRIVE
GATE
MODE SWITCH
BLANKING
1H DELAY
DELAY
TRAP
DL
HORIZONTAL APERTURE COMPENSATOR
APCN LEVEL
BPF
HAP CO1
HAP CO2
GAIN SELECT
VERTICAL APERTURE COMPENSATOR
LPF
CORING
VAPCN GAIN
DETALE
ROM
VH GAIN
VH SLICE
Y GAMMA
SOLAR
GAMMA ROM
EFECT
FADER OUT LEVEL
FADER
SET UP
WHITE CLIP
SYNC BLK CHARACTER MIX
D/A CONV
INTER FACE
R MATRIX B MATRIX
Gr Gb WHITE BALANCE
R,B WHITE BALANCE
CHROMA GAMMA
HUE GAIN
BURST BLK ADD
ENCODER
PAL NTSC
CBL
VOC
4.43MHz BPF
CN504
CAM Y
CAM C
VIDEO (1) (VA-77)
HALF H KILLER
SPEED DETECT
PHASE COMP
AFC
LPF
602fH VCO
SYNC GENERATOR
1/3 COUNTER
MOSAIC HOLD TIMING
POLAITY
PROD DELAY
CONTROL DATA LATCH
PB TITLE COLOR DATA
CRTC MASC
PB TITLE CHROMA MODURATOR D/A CONVERTER
VCO 4FSC (VTR) 5/4 (PAL CAM) OFF (NTSC CAM)
PHASE COMP
1/4 (VTR) 1/5 (PAL CAM)
760H:760H CCD SYSTEM
510H:510H CCD SYSTEM
NTSC-VTR
PAL-CAM
PAL-VTR
OSC
FL701
CN701
FOR CHECK
SYSTEM CONTROL
CAM VD
PB V
FLD
TG STBY 1
CRTC CS
SG CS
CAM COSM CS
DATA TO SLVE
DATA TO MAST
SCK
SYS RESET
CR PULS
K OUT 5
K IN 0
K IN 6
CN950
POWER (PS-308)
D4V
D5V
CAM 5V
-9V
15V
Q702 3V REG
Q708
IF 4V (IC802, 707)
IC707 (80)
IC707 (84)
IC707 (68)
IC707 (69)
IC707 (67)
IC707 (30)
IC707 (51)
IC707 (64)
IC707 (66)
IC704 (4)
IC704 (63)
IC803 (2)
IC803 (8)

3-4. CAMERA MICROPROCESSOR PIN FUNCTION (IC709 ON CS-37 BOARD: CXP80624-299Q)

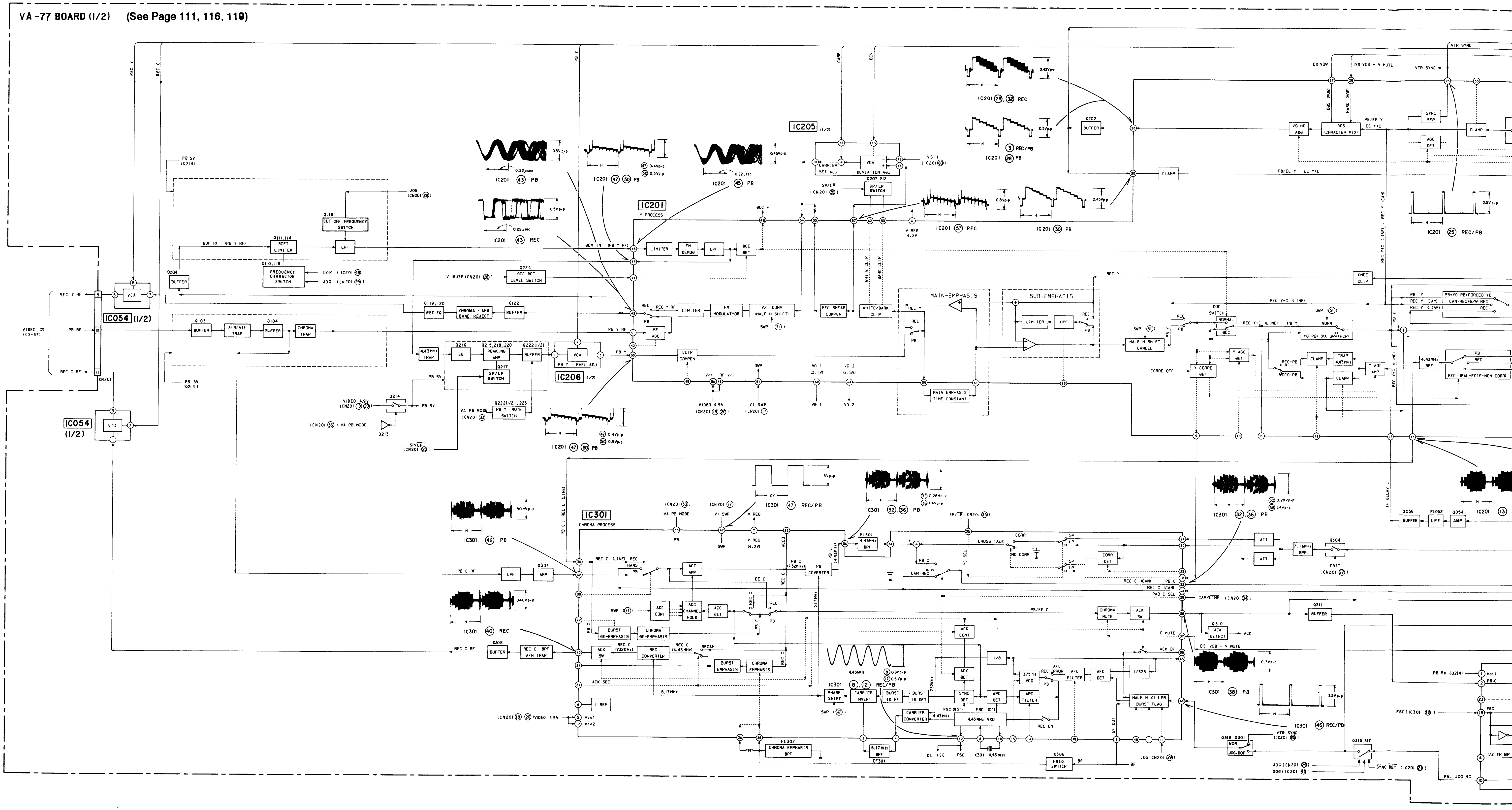
Pin No.	Signal	I/O	Function
1	EPROM DI	O	Not used.
2	EPROM SCK	O	
3	ZOOM M REV	O	Zoom motor control signal. Normally "H". 20 msec period PWM signal when rotating to WIDE.
4	ZOOM M FWD	O	Zoom motor control signal. Normally "H". 20 msec period PWM signal when rotating to TELE.
5	PB1		Not used.
6	PB0		
7	RT07/D7		
8	RT06/D6		
9	RT05/D5		
10	CORE RESET	O	Camera core (IC707 on CS-37 board) reset signal. Normally "H". "L" when reset.
11	PDR RESET	O	Focus predriver (IC706 on CS-37 board) reset signal. Normally "H". "L" when reset.
12	TG STBY1		Not used.
13	TG STBY2		
14	OPD RESET	O	OPD (IC705 on CS-37 board) reset signal. "H": camera mode. "L": VTR mode.
15	PJ7/FSEL31		Not used.
16	PJ6/FSEL30		
17	PJ5/FSEL21		
18	PJ4/FSEL20		
19	PJ3/FSEL11		
20	PJ2/FSEL10		
21	PJ1/FSEL01		
22	PJ0/FSEL00		
23	EPROM DO	O	
24	EPROM BUSY	I	BUSY signal from EEPROM. Normally "H". "L" pulse when data reading/writing.
25	FOC NEAR		Not used.
26	FOC FAR		
27	PD3/C	I	Fixed to +5V.
28	TA/$\overline{\text{CA}}$	I	
29	WIDE END		Fixed to +5V.
30	FOC END FAR	I	Focus end FAR sensor input. Normally "L".
31	$\overline{\text{CAM ON}}$	O	Power supply control signal. Normally "L".
32	PH6		Not used.
33	PH5		
34	PH4		
35	PH3		
36	PH2		
37	PH1		
38	FOC END LED	O	Focus end sensor LED control signal. Normally "H" (4.4V).
39	MP		Connected to GND.
40	$\overline{\text{CAM RESET}}$	I	Reset signal input. Normally "H". "L" when reset.
41	VSS		GND
42	XTAL	O	12 MHz clock oscillation circuit
43	EXTAL	I	
44	CS CAM	I	Chip select signal from mode control microprocessor.
45	VTR SO	I	Serial data input from mode control microprocessor.
46	VTR SI	O	Serial data output from mode control microprocessor.
47	VTR SCK	I	Serial data transfer clock
48	PF7/AN11		Not used.
49	PF6/AN10		
50	PF5/AN9		

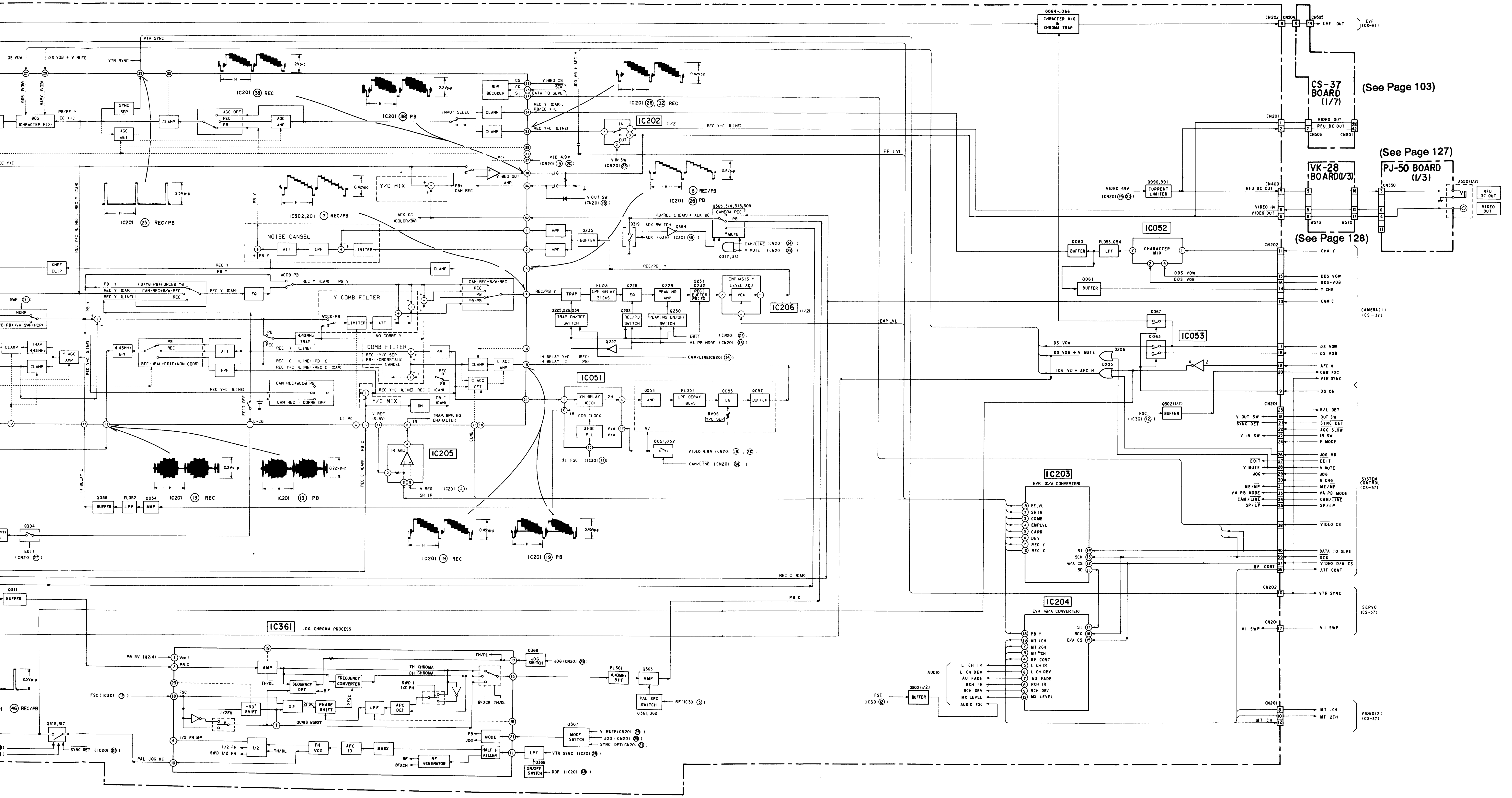
Pin No.	Signal	I/O	Function
51	PF4		Not used.
52	AVSS		GND
53	AVREF		Analog input port reference voltage (5V)
54	AVDD		Analog input port voltage (5V)
55	PF3/AN7		Connected to GND.
56	PF2/AN6		
57	MAN FOCUS (2)	I	Manual focus input. 0 to 5 Vdc.
58	MAN FOCUS (1)	I	Manual focus input. 0 to 5 Vdc.
59	ZOOM SW	I	Zoom key input. 4.3V: F. TELE, 3.1V: TELE, 0.7V: F. WIDE, 1.9V: WIDE, 2.5V: no input.
60	ZOOM POS X4	I	Zoom position voltage. approx. 0V (WIDE end) to approx. 3V (TELE end).
61	HALL A/D	I	Hall voltage. approx. 1V (iris open) to approx. 3V (iris close).
62	ZOOM POSITION A/D	I	Zoom position voltage. approx. 0.2V (WIDE end) to approx. 2.4V (TELE end).
63	PG7/EX11		Connected to 5V.
64	PG6/EX10		
65	PG5/SYNC1		
66	VTR SYNC		
67	PB CTL		
68	DPG		
69	FOC FG		
70	AF BUSY	I	AF busy signal
71	PE7/DAB1		Not used.
72	PE6/DAB0		
73	PE5/DAA1		
74	PE4/DAA0		
75	IRIS PWM	O	Iris control signal. 25.5 μsec period PWM signal
76	ZP PWM	O	Zoom position detection voltage output. 25.5 μsec period PWM signal
77	AJST	I	Adjustment timing pulse input. Normally "H".
78	VD	I	VD signal input from sync generator
79	CAM SI	I	Serial data input
80	CAM SO	O	Serial data output
81	CAM SCK	O	Serial data transfer clock
82	CS CAM		Not used.
83	PI/TO		
84	PI/PWM		
85	PI/PO		
86	PI O		Connected to +5V.
87	PKO		
88	GND		GND
89	VDD		+5V power supply
90	VPP		
91	PA7/A15		Not used.
92	CS PDR	O	Chip select signal to focus predriver (IC706 on CS-37 board)
93	CS CAM D/A	O	Chip select signal to camera EVR (IC702 on CS-37 board)
94	CS ROM	O	Chip select signal to EEPROM (IC712 on CS-37 board)
95	CS OPD	O	Chip select signal to OPD (IC705 on CS-37 board)
96	NTSC	O	NTSC: "L", PAL: "H"
97	CS CORE	O	Chip select signal to camera core (IC707 on CS-37 board)
98	CS TG	O	Select signal to timing generator (IC801 on CS-37 board)
99	J STB		Not used.
100	PB6		

3-5. CAMERA (2) BLOCK DIAGRAM

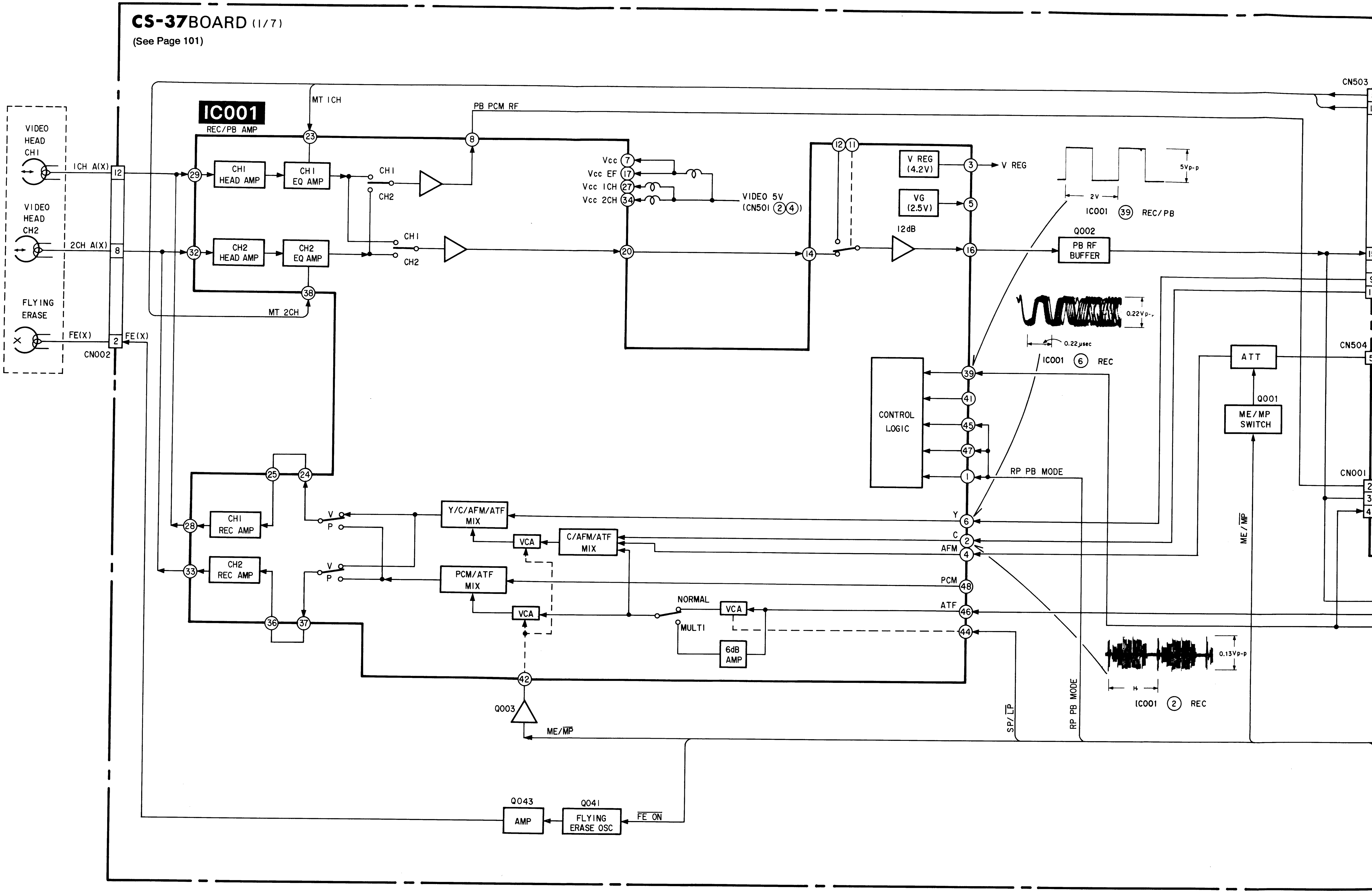

CS-37 BOARD (1/7)
(See Page 97)
(See Page 97)
LENS BLOCK
CAMERA (1)
IRIS PWM (IC709 (75))
REF 2V (IC702 ⑫)
HALL OUT (IC709 (61))
HALL OFS (IC702 ⑧)
HALL GAIN (IC702 ⑦)
ZOOM FWD (IC709 ④)
ZOOM REV (IC709 ③)
ZOOM SPD (IC702 ⑥)
AV REF (IC709 (53))
ZOOM POS (IC709 (62))
ZOOM POS X4 (IC702 (60))
ZOOM PWM (IC709 (76))
TA/CA (IC709 ㉘)
FOC IN 4 (IC706 ⑮)
FOC IN 2 (IC706 ⑬)
FOC IN 3 (IC706 ⑭)
FOC IN 1 (IC706 ⑫)
FOC END FAR (IC709 ㉚)
FOC END LED (IC709 (38))
LPF
IC852 (1/4)
IC851 (1/2)
IRIS DRIVE
IC851 (1/2)
HALL AMP
IC852 (1/4)
HALL BIAS CONTROL
IC852 (1/4)
HALL GAIN CONTROL
Q851
IC854
ZOOM MOTOR DRIVE
IN 1
IN 2
OUT 1
OUT 2
Vcc
V CONT
Vss
MT 5V (Q509)
Q853
DRIVE CURRENT LIMITER
IC852 (1/4)
ZOOM REF
IC855 (1/2)
ZOOM POS X4
LPF
IC855 (1/2)
LPF
IC853
FOCUS MOTOR DRIVE
IN 1
IN 2
EN 1
EN 2
A
B
B̄
Ā
Vcc
MT 5V (Q509)
CN851
DRIVE (+)
DRIVE (-)
CONT (+)
CONT (-)
BIAS (+)
HALL (+)
HALL (-)
BIAS (-)
ZOOM W
ZOOM T
ZP REF
ZOOM ENC
GND
FOCUS MA
FOCUS MB
FOCUS M̄B̄
FOCUS M̄Ā
SENS Vcc
SENS
LED
M904
IRIS MOTOR
M
H
M906
ZOOM MOTOR
ZOOM POSITION
M905
FOCUS MOTOR
FOCUS END SENSOR

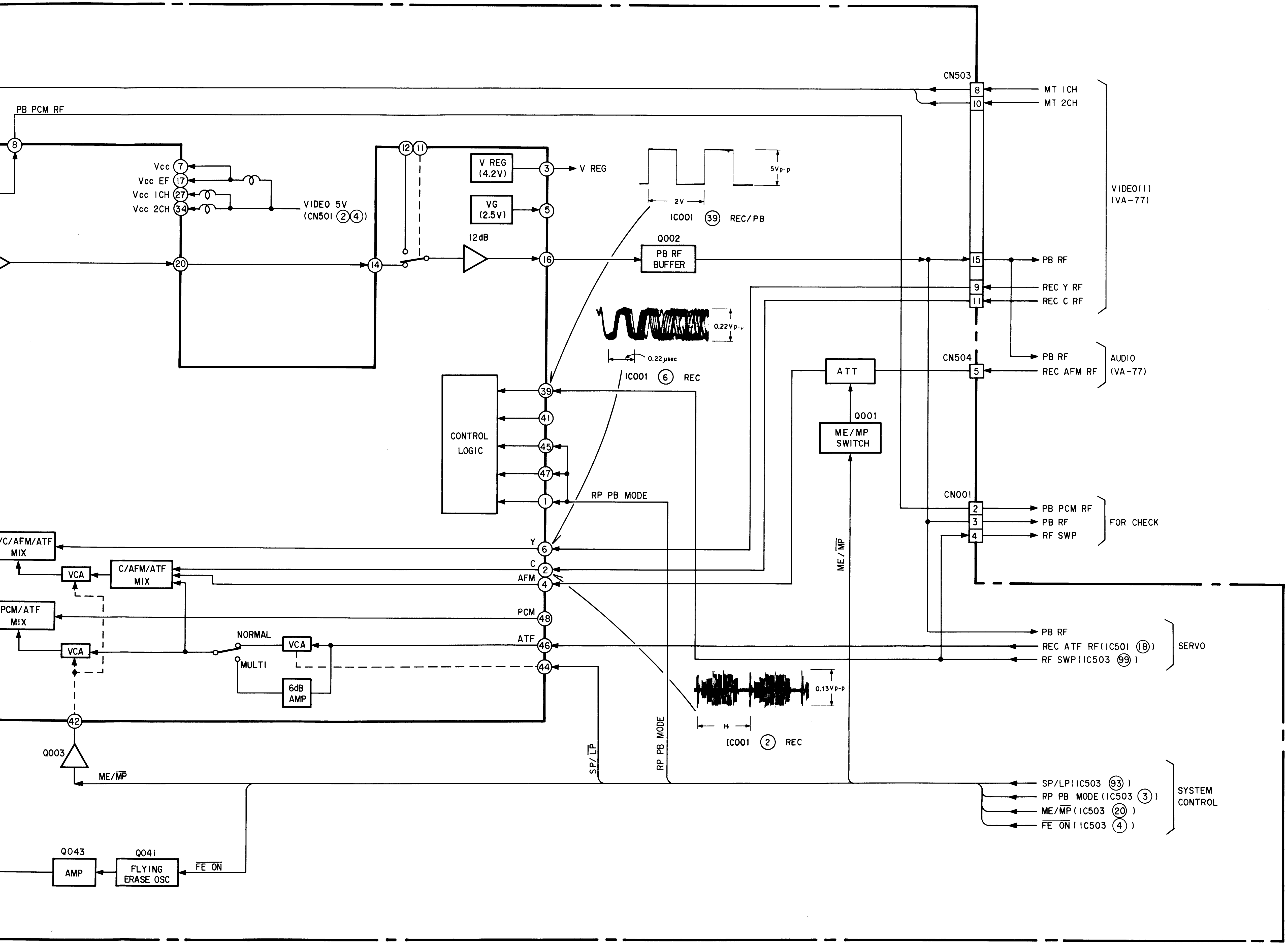
3-6. VIDEO (1) BLOCK DIAGRAM


VA-77 BOARD (1/2) (See Page 111, 116, 119)
IC054 (1/2)
VCA
CN201
VIDEO (2) (CS-37)
REC Y RF
PB RF
REC C RF
REC Y
REC C
PB Y
Q204 BUFFER
Q111,114 SOFT LIMITER
Q116 CUT-OFF FREQUENCY SWITCH
LPF
Q110,118 FREQUENCY CHARACTOR SWITCH
Q224 DOC DET LEVEL SWITCH
Q119,120 REC EQ
CHROMA / AFM BAND REJECT
Q122 BUFFER
Q103 BUFFER
AFM/ATF TRAP
Q104 BUFFER
CHROMA TRAP
4.43MHz TRAP
Q216 EQ
Q215,218,220 PEAKING AMP
Q222(1/2) BUFFER
Q217 SP/LP SWITCH
Q222(1/2),223 PB Y MUTE SWITCH
Q214
Q213
IC206 (1/2)
PB Y LEVEL ADJ
IC201 Y PROCESS
LIMITER
FM DEMOD
LPF
DOC DET
FM MODULATOR
V/I CONV (HALF H SHIFT)
RF AGC
CLIP COMPEN
IC205 (1/2)
CARRIER SET ADJ
DEVIATION ADJ
Q207,212 SP/LP SWITCH
REC SMEAR COMPEN
WHITE/DARK CLIP
WHITE CLIP
DARK CLIP
MAIN-EMPHASIS
MAIN EMPHASIS TIME CONSTANT
SUB-EMPHASIS
LIMITER
HPF
Q202 BUFFER
CLAMP
VG HD ADD
Q05 (CHRACTER MIX)
SYNC SEP
AGC DET
KNEE CLIP
HALF H SHIFT CANCEL
DOC SWITCH
NORMAL
Y CORRE DET
Y AGC DET
TRAP 4.43MHz
Y AGC AMP
4.43MHz BPF
IC201 (43) PB
IC201 (43) REC
IC201 (47) (50) PB
IC201 (45) PB
IC201 (28), (32) REC
IC201 (28) PB
IC201 (57) REC
IC201 (30) PB
IC201 (25) REC/PB
IC301 CHROMA PROCESS
Q307 AMP
LPF
ACC AMP
ACC CONT
ACC CHANNEL HOLD
ACC DET
BURST DE-EMPHASIS
CHROMA DE-EMPHASIS
Q308 BUFFER
REC C BPF AFM TRAP
ACK SW
REC CONVERTER
BURST EMPHASIS
CHROMA EMPHASIS
I REF
PB COVERTER
FL301 4.43MHz BPF
CROSS TALK
NO CORR
CORR DET
ATT
7.16MHz BPF
Q304
CHROMA MUTE
ACK SW
Q311 BUFFER
Q310 ACK DETECT
ACK CONT
ACK DET
1/8
375fH VCO
AFC FILTER
AFC DET
1/375
PHASE SHIFT
CARRIER INVERT
BURST 16 FF
BURST 16 DET
SYNC DET
APC DET
APC FILTER
CARRIER CONVERTER
4.43MHz VXO
HALF H KILLER BURST FLAG
FL302 CHROMA EMPHASIS BPF
CF301 5.17MHz BPF
X301 4.43MHz
Q306 FREQ SWITCH
Q316 Q301 NOR JOG-DOP
Q315,317
Q056 BUFFER
FL052 LPF
Q054 AMP
IC301 (42) PB
IC301 (40) REC
IC301 (47) REC/PB
IC301 (32),(36) PB
IC301 (8),(12) REC/PB
IC301 (38) PB
IC301 (46) REC/PB

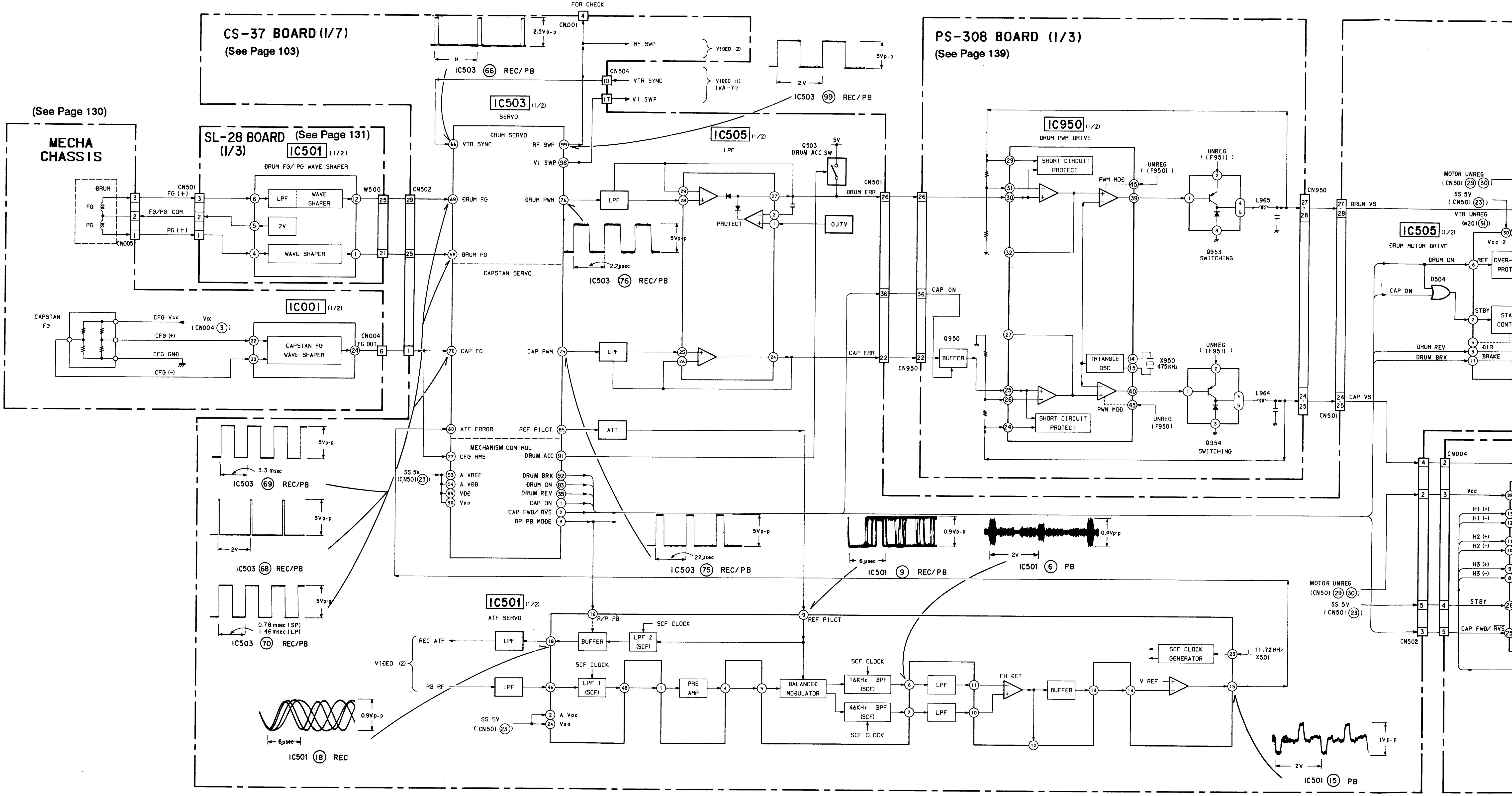

IC201 ㊳ REC
IC201 ㊳ PB
IC201 ㉘ ㉜ REC
IC201 ㉕ REC/PB
IC302,201 ⑦ REC/PB
IC201 ③ REC/PB
IC201 ㉘ PB
IC201 ⑬ REC
IC201 ⑬ PB
IC201 ⑲ REC
IC201 ⑲ PB
IC201 ㊻ REC/PB
IC202
IC205
IC206
IC051
IC052
IC053
IC203
EVR (D/A CONVERTER)
IC204
EVR (D/A CONVERTER)
IC361
JOG CHROMA PROCESS
NOISE CANSEL
Y COMB FILTER
COMB FILTER
Y/C MIX
BUS DECODER
VIDEO OUT AMP
AGC AMP
AGC DET
SYNC SEP
CLAMP
KNEE CLIP
TRAP
EQ
PEAKING AMP
LPF DELAY
EMPHASIS Y LEVEL ADJ
VCA
ATT
LPF
LIMITER
HPF
BUFFER
C ACC AMP
C ACC DET
2H DELAY (CCD)
CCD CLOCK
3FSC PLL
CHARACTER MIX
CHRACTER MIX & CHROMA TRAP
CURRENT LIMITER
FREQUENCY CONVERTER
SEQUENCE DET
PHASE SHIFT
APC DET
-90° SHIFT
FH VCO
AFC ID
MASK
BF GENERATOR
HALF H KILLER
MODE SWITCH
JOG SWITCH
PAL SEC SWITCH
ON/OFF SWITCH
CS-37 BOARD (1/7)
(See Page 103)
VK-28 BOARD (1/3)
(See Page 128)
PJ-50 BOARD (1/3)
(See Page 127)
EVF (CK-61)
EVF OUT
RFU DC OUT
VIDEO OUT
VIDEO IN
CAMERA (1) (CS-37)
SYSTEM CONTROL (CS-37)
SERVO (CS-37)
VIDEO (2) (CS-37)
CN201
CN202
CN400
CN504
CN505
CN550
AUDIO

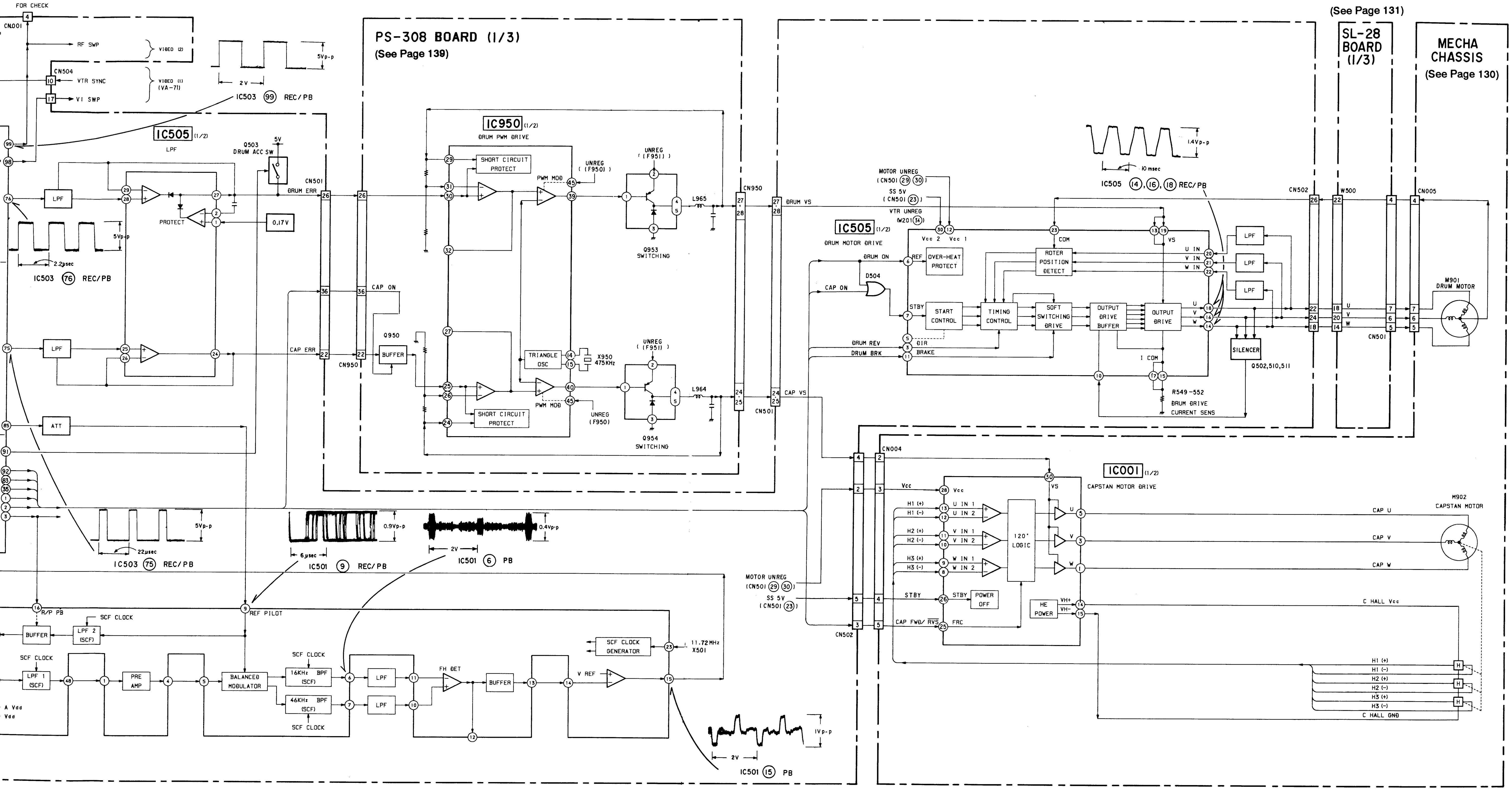
3-7. VIDEO (2) BLOCK DIAGRAM


CS-37BOARD (1/7)
(See Page 101)
VIDEO HEAD CH1
VIDEO HEAD CH2
FLYING ERASE
1CH A(X)
2CH A(X)
FE(X)
CN002
12
8
2
IC001
REC/PB AMP
MT 1CH
MT 2CH
PB PCM RF
CH1 HEAD AMP
CH2 HEAD AMP
CH1 EQ AMP
CH2 EQ AMP
CH1
CH2
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
VIDEO 5V
(CN501 ② ④)
12dB
V REG (4.2V)
VG (2.5V)
V REG
CONTROL LOGIC
RP PB MODE
Y
C
AFM
PCM
ATF
CH1 REC AMP
CH2 REC AMP
V
P
Y/C/AFM/ATF MIX
C/AFM/ATF MIX
PCM/ATF MIX
VCA
NORMAL
MULTI
6dB AMP
Q003
ME/MP
Q043
AMP
Q041
FLYING ERASE OSC
FE ON
SP/LP
RP PB MODE
5Vp-p
2V
IC001 ㊴ REC/PB
Q002
PB RF BUFFER
0.22Vp-p
0.22μsec
IC001 ⑥ REC
0.13Vp-p
H
IC001 ② REC
CN503
CN504
ATT
Q001
ME/MP SWITCH
CN001
ME/MP

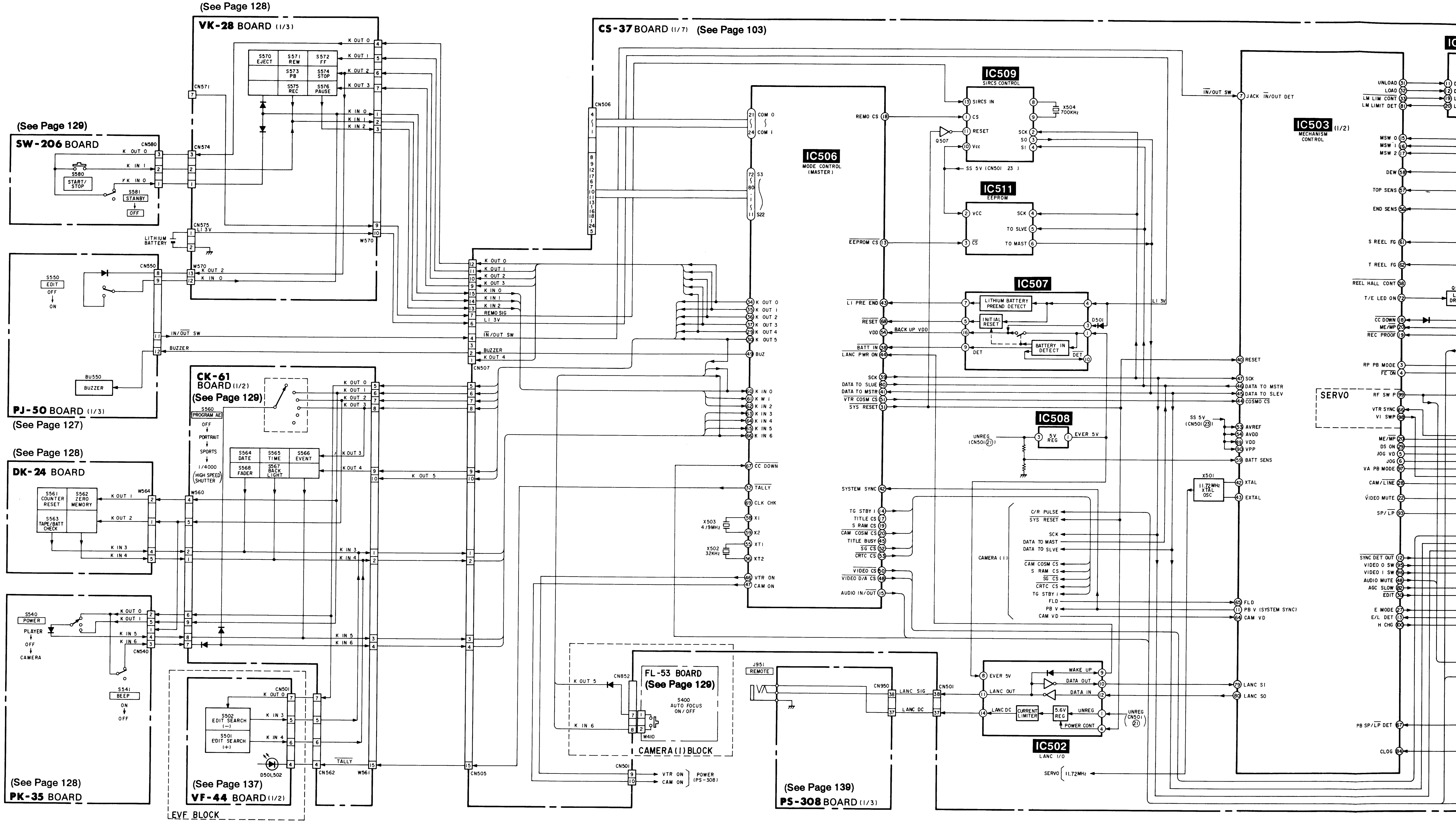

PB PCM RF
Vcc 7
Vcc EF 17
Vcc 1CH 27
Vcc 2CH 34
VIDEO 5V
(CN501 ② ④)
20
14
12 11
12dB
V REG (4.2V)
VG (2.5V)
3 V REG
5
16
5Vp-p
2V
IC001 ㊴ REC/PB
Q002
PB RF BUFFER
0.22Vp-p
0.22μsec
IC001 ⑥ REC
CONTROL LOGIC
39 41 45 47 1
RP PB MODE
Y 6
C 2
AFM 4
PCM 48
ATF 46
44
/C/AFM/ATF MIX
VCA
C/AFM/ATF MIX
PCM/ATF MIX
VCA
NORMAL
MULTI
VCA
6dB AMP
42
Q003
ME/MP
SP/LP
RP PB MODE
0.13Vp-p
H
IC001 ② REC
Q043 AMP
Q041 FLYING ERASE OSC
FE ON
ATT
Q001
ME/MP SWITCH
ME/MP
CN503
8 MT 1CH
10 MT 2CH
15 PB RF
9 REC Y RF
11 REC C RF
VIDEO(1) (VA-77)
CN504
PB RF
5 REC AFM RF
AUDIO (VA-77)
CN001
2 PB PCM RF
3 PB RF
4 RF SWP
FOR CHECK
PB RF
REC ATF RF(IC501 ⑱)
RF SWP(IC503 ㊾)
SERVO
SP/LP(IC503 ㊸)
RP PB MODE(IC503 ③)
ME/MP(IC503 ⑳)
FE ON(IC503 ④)
SYSTEM CONTROL

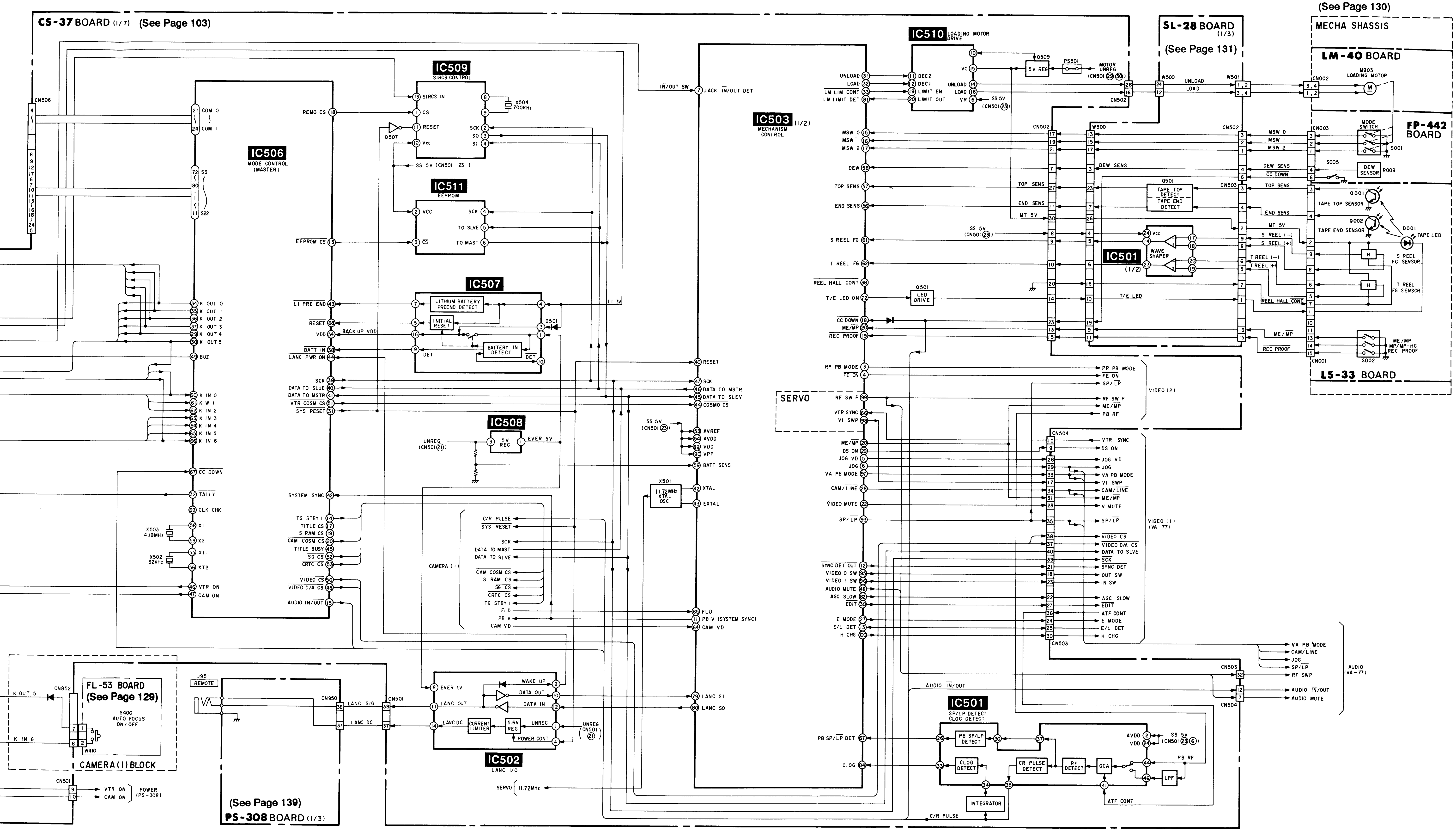
3-8. SERVO BLOCK DIAGRAM


CS-37 BOARD (1/7)
(See Page 103)
(See Page 130)
MECHA CHASSIS
SL-28 BOARD (1/3)
(See Page 131)
IC501 (1/2)
DRUM FG/ PG WAVE SHAPER
IC001 (1/2)
CAPSTAN FG WAVE SHAPER
IC503 (1/2)
SERVO
DRUM SERVO
CAPSTAN SERVO
MECHANISM CONTROL
IC505 (1/2)
LPF
PROTECT
Q503 DRUM ACC SW
IC501 (1/2)
ATF SERVO
PS-308 BOARD (1/3)
(See Page 139)
IC950 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
PWM MOD
TRIANGLE OSC
X950 475KHz
Q953 SWITCHING
Q954 SWITCHING
Q950 BUFFER
IC505 (1/2)
DRUM MOTOR DRIVE
FOR CHECK
CN001
RF SWP
VIDEO (2)
CN504
VTR SYNC
VI SWP
VIDEO (1) (VA-71)
IC503 66 REC/PB
IC503 99 REC/PB
IC503 76 REC/PB
IC503 75 REC/PB
IC503 69 REC/PB
IC503 68 REC/PB
IC503 70 REC/PB
0.78 msec (SP) 1.46 msec (LP)
IC501 9 REC/PB
IC501 6 PB
IC501 18 REC
IC501 15 PB
DRUM ERR
CAP ERR
CAP ON
DRUM VS
CAP VS
REF PILOT
ATF ERROR
CFG HMS
DRUM ACC
DRUM BRK
DRUM ON
DRUM REV
CAP FWD/ RVS
RP PB MODE
SS 5V (CN501 23)
A VREF
A VDD
VDD
VPP
ATT
REC ATF
PB RF
BUFFER
LPF 2 (SCF)
LPF 1 (SCF)
PRE AMP
BALANCED MODULATOR
16KHz BPF (SCF)
46KHz BPF (SCF)
SCF CLOCK
SCF CLOCK GENERATOR
FH DET
V REF
11.72MHz X501
R/P PB
UNREG (F950)
UNREG (F951)
L965
L964
CN950
CN501
CN502
CN004
CN005
W500
MOTOR UNREG (CN501 29 30)
SS 5V (CN501 23)
VTR UNREG
D504
STBY
DIR
BRAKE
Vcc 2
OVER-
PROT
H1 (+)
H1 (-)
H2 (+)
H2 (-)
H3 (+)
H3 (-)
CAPSTAN FG
CFG Vcc
Vcc (CN004 3)
CFG (+)
CFG GND
CFG (-)
FG OUT
DRUM
FG
PG
FG (+)
FG/PG COM
PG (+)
WAVE SHAPER
2V
5Vp-p
2.5Vp-p
0.9Vp-p
0.4Vp-p
1Vp-p
3.3 msec
2.2μsec
22μsec
6μsec


FOR CHECK
CN001
RF SWP
VIDEO (2)
CN504
VTR SYNC
VI SWP
VIDEO (1) (VA-71)
5Vp-p
2V
IC503 (99) REC/PB
IC505 (1/2)
LPF
Q503 DRUM ACC SW
5V
CN501
DRUM ERR
PROTECT
0.17V
5Vp-p
2.2μsec
IC503 (76) REC/PB
CAP ERR
ATT
5Vp-p
22μsec
IC503 (75) REC/PB
0.9Vp-p
6μsec
IC501 (9) REC/PB
0.4Vp-p
2V
IC501 (6) PB
R/P PB
SCF CLOCK
BUFFER
LPF 2 (SCF)
LPF 1 (SCF)
A Vdd
Vdd
PRE AMP
REF PILOT
BALANCED MODULATOR
16KHz BPF (SCF)
46KHz BPF (SCF)
LPF
FH DET
BUFFER
V REF
SCF CLOCK GENERATOR
11.72MHz X501
1Vp-p
2V
IC501 (15) PB
PS-308 BOARD (1/3)
(See Page 139)
IC950 (1/2)
DRUM PWM DRIVE
SHORT CIRCUIT PROTECT
PWM MOD
UNREG (F950)
UNREG (F951)
Q953 SWITCHING
L965
CN950
CAP ON
Q950
BUFFER
TRIANGLE OSC
X950 475KHz
L964
Q954 SWITCHING
DRUM VS
CAP VS
MOTOR UNREG (CN501 (29)(30))
SS 5V (CN501 (23))
VTR UNREG (W201 (34))
IC505 (1/2)
DRUM MOTOR DRIVE
Vcc 2 Vcc 1
DRUM ON
OVER-HEAT PROTECT
D504
CAP ON
STBY
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
OUTPUT DRIVE
COM
ROTER POSITION DETECT
VS
U IN
V IN
W IN
LPF
DRUM REV
DRUM BRK
DIR
BRAKE
I COM
R549-552 DRUM DRIVE CURRENT SENS
SILENCER
Q502,510,511
1.4Vp-p
10 msec
IC505 (14),(16),(18) REC/PB
(See Page 131)
SL-28 BOARD (1/3)
CN502
W500
MECHA CHASSIS
(See Page 130)
CN005
M901 DRUM MOTOR
CN004
IC001 (1/2)
CAPSTAN MOTOR DRIVE
Vcc
H1 (+)
H1 (-)
H2 (+)
H2 (-)
H3 (+)
H3 (-)
U IN 1
U IN 2
V IN 1
V IN 2
W IN 1
W IN 2
120° LOGIC
STBY
POWER OFF
HE POWER
VH+
VH-
CAP FWD/RVS
FRC
MOTOR UNREG (CN501 (29)(30))
SS 5V (CN501 (23))
CAP U
CAP V
CAP W
M902 CAPSTAN MOTOR
C HALL Vcc
C HALL GND

3-9. SYSTEM CONTROL BLOCK DIAGRAM


(See Page 128)
VK-28 BOARD (1/3)
S570 EJECT
S571 REW
S572 FF
S573 PB
S574 STOP
S575 REC
S576 PAUSE
K OUT 0
K OUT 1
K OUT 2
K OUT 3
K IN 0
K IN 1
K IN 2
CN571
CN574
CN575
LI 3V
LITHIUM BATTERY
W570
(See Page 129)
SW-206 BOARD
CN580
S580 START/STOP
S581 STANBY OFF
PJ-50 BOARD (1/3)
(See Page 127)
CN550
S550 EDIT OFF ON
IN/OUT SW
BUZZER
BU550
(See Page 128)
DK-24 BOARD
S561 COUNTER RESET
S562 ZERO MEMORY
S563 TAPE/BATT CHECK
K IN 3
K IN 4
W564
W560
CK-61 BOARD (1/2)
(See Page 129)
S560 PROGRAM AE
OFF PORTRAIT SPORTS 1/4000 (HIGH SPEED SHUTTER)
S564 DATE
S565 TIME
S566 EVENT
S568 FADER
S567 BACK LIGHT
K OUT 4
K OUT 5
S540 POWER
PLAYER OFF CAMERA
K IN 5
K IN 6
CN540
S541 BEEP ON OFF
(See Page 128)
PK-35 BOARD
CN501
S502 EDIT SEARCH (−)
S501 EDIT SEARCH (+)
D501,502
TALLY
CN562
W561
(See Page 137)
VF-44 BOARD (1/2)
EVF BLOCK
CN505
CN507
REMO SIG
BUZZER
CS-37 BOARD (1/7) (See Page 103)
CN506
IC506 MODE CONTROL (MASTER)
COM 0
COM 1
S3
S22
REMO CS
EEPROM CS
K OUT 0 – K OUT 5
BUZ
K IN 0 – K IN 6
CC DOWN
TALLY
CLK CHK
X503 4.19MHz
X502 32KHz
XI X2 XT1 XT2
VTR ON
CAM ON
LI PRE END
RESET
VDD
BACK UP VDD
BATT IN
LANC PWR ON
SCK
DATA TO SLVE
DATA TO MSTR
VTR COSM CS
SYS RESET
SYSTEM SYNC
TG STBY 1
TITLE CS
S RAM CS
CAM COSM CS
TITLE BUSY
SG CS
CRTC CS
VIDEO CS
VIDEO D/A CS
AUDIO IN/OUT
IC509 SIRCS CONTROL
SIRCS IN
CS
RESET
Vcc
SCK SO SI
X504 700KHz
Q507
SS 5V (CN501 23)
IC511 EEPROM
VCC SCK TO SLVE TO MAST
IC507
LITHIUM BATTERY PREEND DETECT
INITIAL RESET
BATTERY IN DETECT
DET
D501
IC508 5V REG
UNREG (CN501 ㉑)
EVER 5V
CAMERA (1)
C/R PULSE
SYS RESET
SCK
DATA TO MAST
DATA TO SLVE
CAM COSM CS
S RAM CS
SG CS
CRTC CS
TG STBY 1
FLD
PB V
CAM VD
CN852
FL-53 BOARD (See Page 129)
S400 AUTO FOCUS ON/OFF
W410
CAMERA (1) BLOCK
VTR ON
CAM ON
POWER (PS-308)
J951 REMOTE
CN950
LANC SIG
LANC DC
(See Page 139)
PS-308 BOARD (1/3)
IC502 LANC I/O
EVER 5V
WAKE UP
LANC OUT
DATA OUT
DATA IN
LANC DC
CURRENT LIMITER
5.6V REG
UNREG
POWER CONT
UNREG (CN501 ㉑)
SERVO 11.72MHz
IC503 (1/2) MECHANISM CONTROL
IN/OUT SW
JACK IN/OUT DET
UNLOAD
LOAD
LM LIM CONT
LM LIMIT DET
MSW 0
MSW 1
MSW 2
DEW
TOP SENS
END SENS
S REEL FG
T REEL FG
REEL HALL CONT
T/E LED ON
CC DOWN
ME/MP
REC PROOF
RP PB MODE
FE ON
RESET
SCK
DATA TO MSTR
DATA TO SLEV
COSMO CS
SS 5V (CN501 ㉓)
AVREF
AVDD
VDD
VPP
BATT SENS
X501 11.72MHz XTAL OSC
XTAL
EXTAL
FLD
PB V (SYSTEM SYNC)
CAM VD
LANC SI
LANC SO
SERVO
RF SW P
VTR SYNC
VI SWP
ME/MP
DS ON
JOG VD
JOG
VA PB MODE
CAM/LINE
VIDEO MUTE
SP/LP
SYNC DET OUT
VIDEO 0 SW
VIDEO 1 SW
AUDIO MUTE
AGC SLOW
EDIT
E MODE
E/L DET
H CHG
PB SP/LP DET
CLOG


CS-37 BOARD (1/7) (See Page 103)
IC506 MODE CONTROL (MASTER)
IC509 SIRCS CONTROL
IC511 EEPROM
IC507
LITHIUM BATTERY PREEND DETECT
INITIAL RESET
BATTERY IN DETECT
IC508
5V REG
IC502 LANC I/O
CURRENT LIMITER
5.6V REG
IC503 (1/2) MECHANISM CONTROL
IC510 LOADING MOTOR DRIVE
IC501 (1/2) WAVE SHAPER
IC501 SP/LP DETECT CLOG DETECT
PB SP/LP DETECT
CLOG DETECT
CR PULSE DETECT
RF DETECT
GCA
LPF
INTEGRATOR
X501 11.72MHz XTAL OSC
X503 4.19MHz
X502 32KHz
X504 700KHz
SERVO
CAMERA (1)
VIDEO (2)
VIDEO (1) (VA-77)
AUDIO (VA-77)
SL-28 BOARD (1/3) (See Page 131)
(See Page 130)
MECHA SHASSIS
LM-40 BOARD
M903 LOADING MOTOR
FP-442 BOARD
MODE SWITCH
DEW SENSOR
TAPE TOP SENSOR
TAPE END SENSOR
TAPE LED
S REEL FG SENSOR
T REEL FG SENSOR
LS-33 BOARD
FL-53 BOARD (See Page 129)
S400 AUTO FOCUS ON/OFF
CAMERA (1) BLOCK
J951 REMOTE
(See Page 139)
PS-308 BOARD (1/3)
VTR ON
CAM ON
POWER (PS-308)
K OUT 5
K IN 6
CN506
CN852
CN950
CN501
CN502
CN503
CN504
W500
W501
CN001
CN002
CN003
UNLOAD
LOAD
MSW 0
MSW 1
MSW 2
DEW SENS
CC DOWN
TOP SENS
END SENS
MT 5V
S REEL (−)
S REEL (+)
T REEL (−)
T REEL (+)
REEL HALL CONT
T/E LED
ME/MP
REC PROOF
LANC SIG
LANC DC
UNREG (CN501 ㉑)
SS 5V (CN501 ㉓)

3-10. MECHANISM CONTROL MICROPROCESSOR PIN FUNCTION (IC503 ON CS-37 BOARD: CXP80624)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	11	CAP ON	O	MD	Capstan driver ON/OFF control signal. "H" when capstan ON.
2	PB4/PP012	CAP FWD/RVS	O	MD	Capstan rotating direction control signal. "H": FWD, "L": RVS.
3	PB3/PP011	RP PB MODE	O	RP	REC/PB select signal of REC/PB amplifier (IC001 on CS-37 board) and ATF servo IC (IC501 on CS-37 board). "H": PB.
4	PB2/PP010	FE ON	O	RP	Flying erase oscillation ON/OFF control signal. "L": oscillation.
5	PB1/PP09	JOG VD	O	VA	False VD signal to be inserted into playback video signal during variable speed playback.
6	PB0/PP08	JOG	O	VA	Variable speed/normal speed playback select signal of video circuit. "H" when variable speed playback.
7	PC7/RT07	JACK IN/OUT	I	VA	Jack in/out switch input. "L" when input.
8	PC6/RT06	1.7M DET	I	VA	Not used.
9	PC5/RT05	JACK MONO/STE DET	I	VA	
10	PC4/RT04	INT VD	I		
11	PC3/RT03	PB V (SYSTEM SYNC)	O	MODE CON	V sync for mode controller.
12	PC2/RT018	SYNC DET OUT	O	VA	Sync detect output. "L" when Sync is detected.
13	PC1/RT017	E/L DET	I	VA	Not used.
14	PC0/RT016	MIC MONO/ST DET	I	AU	
15	PJ7	M SW 0	I	MD	Mode switch input.
16	PJ6	M SW 1	I	MD	
17	PJ5	M SW 2	I	MD	
18	PJ4	CC DOWN	I	MD	Cassette compartment down switch input. "L": down.
19	PJ3	REC PROOF	I	MD	Erasure protection switch input. "L" when REC prohibit.
20	PJ2	ME/MP	I	MD	ME/MP switch input. "L": MP, "H": ME.
21	PJ1	HG/NOR	I	MD	Connected to GND.
22	PJ0	VIDEO MUTE	O	VA	Video output mute signal. "H": mute.
23	PD7	LINE MIX	I	VA	Not used.
24	PD6	MAT SEL 1	I	VA	
25	PD5	MAT SEL 2	I	VA	
26	PD4	MAT ON/OFF	O	VA	
27	PD3	E MODE	O	VA	
28	PD2	CAM/LINE	O	VA	Camera input/line input select signal. "H" when camera input.
29	PD1	DS ON	O	VA	Data screen ON/OFF signal. "H": ON.
30	PD0	EDIT	O	VA	Video circuit EDIT/NORMAL switch signal. "L": EDIT.
31	PH7	UNLOAD	O	SS	Loading motor control signal. "H" or "H" pulse when unloading.
32	PH6	LOAD	O	SS	Loading motor control signal. "H" or "H" pulse when loading.
33	PH5	LM LIM COM	O	SS	Loading motor limiter control signal. Temporary "H" when loading.
34	PH4	COMP REC	O	VA	Not used.
35	PH3	DRUM REV	O	SS	Drum rotating control signal . Normally "L".
36	PH2		O		N.C.
37	PH1		O		
38	PH0	REEL HALL CONT	O	SS	Reel FG sensor (HALL element) power supply control signal. Not used.
39	MP	MP			Connected to GND.
40	RST	RESET	I	MODE CON	Reset signal from mode control microprocessor. "L" when reset.
41	VSS	VSS			GND
42	XTAL	XTAL	I	SS	11.718 MHz clock oscillation circuit.
43	EXTAL	EXTAL	O	SS	
44	CSO	COSMO CS	I	MODE CON	Chip select signal from mode control microprocessor (CS-37 board IC506)
45	S10	DATA TO SLVE	I	MODE CON	Serial data input from mode control microprocessor.

	BL	END	EJECT	USE	LOAD	READY	TURN	REC/PB	FF
M SW 0	L	L	L	H	L	H	H	L	L
M SW 1	L	H	L	L	L	L	H	H	L
M SW 2	L	H	H	H	H	L	L	L	L

Pin No.	Port Name	Signal	I/O	Connection	Function
46	S00	DATA TO MSTR	O	MODE CON	Serial data output to mode control microprocessor.
47	SCKO	SCK	I	MODE CON	Serial clock input from mode control microprocessor.
48	PF7/AN11	AUDIO MUTE	O	VA	Audio output mute signal. "H": mute.
49	PF6/AN10	1.7M ON/OFF	O	VA	Not used.
50	PF5/AN9	GND	I		GND
51	PF4/AN8	GND	I		
52	AVSS	AVSS			Analog port GND.
53	AVREF	AVREF			Analog port reference voltage. Connected to +5V.
54	AVDD	VDD			Analog port power supply (5V).
55	PF3/AN7	N.C.			Connected to GND.
56	PF2/AN6	END SENS	I	SS	Tape end detection signal. Normally "L", "H" pulse: tape end.
57	PF1/AN5	TOP SENS	I	SS	Tape top detection signal. Normally "L", "H" pulse: tape top.
58	PF0/AN4	DEW	I	SS	Dew condensation detection signal. "L" when dew condensation.
59	AN3	BATT SENSE	I	SS	Battery voltage input for battery end detection. 1/2 divided by RB504.
60	AN2	ATF ERROR	I	SS	ATF error, ATF lock error input.
61	AN1	S REEL FG	I	SS	S reel FG signal input.
62	AN0	T REEL FG	I	SS	T reel FG signal input.
63	PG7/EXI1	PG7 (N.C.)			Connected to GND.
64	PG6/EXI0	CAM VD	I	CAM SG	VD signal from camera circuit sync generator. V period pulse.
65	PG5/SYNC1	FLD	I	CAM SG	FIELD signal from camera circuit sync generator. 2V period pulse.
66	PG4/SYNC0	VTR SYNC	I	VA	Composite sync signal separated from REC/PB Y signal.
67	PG3/PBCTL	PB SP/LP DET	I	SS	Discriminates PB tape REC mode when CUE/REVIEW/FF and REW. "L": LP.
68	PG2/DPG	DRUM PG	I	SS	Drum PG signal input. For drum phase servo 40 msec period "H" pulse.
69	PG1/DFG	DRUM FG	I	SS	Drum FG signal input. For drum speed servo 3.4 msec period pulse.
70	PG0/CFG	CAP FG	I	MD	Capstan FG signal input. For capstan speed servo. Approx. 1389 Hz when REC/PB (SP).
71	PE7/DAB0	N.C.	O		N.C.
72	PE6/DAB0	T/E LED ON	O	SS	Tape LED ON/OFF signal. 100 msec period "H" pulse when REC/PB.
73	PE5/DAA1	N.C.	O		N.C.
74	PE4/DAA0	N.C.	O		
75	PE3/PWM1	CAP PWM	O	SS	Capstan error signal output 20.15 μsec PWM signal.
76	PE2/PWM0	DRUM PWM	O	SS	Drum error signal output 20.15 μsec PWM signal.
77	PE1/EC/INT2	C FG	I	MD	Capstan FG signal input. For tape counter.
78	PE0/INT0	$\overline{\text{S JACK IN}}$			Not used, connected to +5V.
79	P17/ST1	LANC IN	I	SS	Control L serial data input.
80	P16/SO1	LANC OUT	O	SS	Control L serial data output.
81	P15/SCK1	LM LIMIT DET	I	SS	Loading motor limiter ON detection signal. Normally "H", "L" when limiter ON.
82	P14/INT1	AGC SLOW			Not used.
83	P13/TO	DRUM ON	O	SS	Drum driver ON/OFF control signal. "H" when drum ON.
84	P12/PWM	CLOG	O	SS	Head clog detection signal. "L" when no trouble.
85	P11/PO	REF PILOT	O	SS	ATF servo reference pilot signal. Synchronized when drum rotation to output by selecting four frequencies. f1=101.02 kHz, f2=117.19 kHz, f3=162.76 kHz and f4=146.48 kHz.
86	P10/PCK				Connected to +5V.
87	PKO	13/10 SW	I	MD	Connected to GND.
88	VSS	VSS			GND
89	VDD	VDD			VDD

Pin No.	Port Name	Signal	I/O	Connection	Function
90	N.C.	(VPP)			Connected to +5V.
91	PA7/PP07	DRUM ACC	O	SS	Drum motor acceleration signal. Normally "L". "H" pulse when SLOW mode.
92	PA6/PP06	DRUM BRK	O	SS	Drum motor brake signal. Normally "L".
93	PA5/PP05	SP/$\overline{\text{LP}}$	O	VA	SP/LP select signal. "L": LP.
94	PA4/PP04		O		N.C.
95	PA3/PP03	VIDEO O SW	O	VA	VIDEO OUT inhibit signal. "H": inhibit.
96	PA2/PP02	VIDEO I SW	O	VA	VIDEO IN/OUT select signal. "L": VIDEO IN.
97	PA1/PP01	VA PB MODE	O	ALL	Video/audio circuit REC/PB select signal. "H": PB.
98	PA0/PP00	VI SWP	O	VA	RF switching pulse signal for video circuit. 25 Hz, 50% duty pulse.
99	PB7/PP015	RF SWP	O	ALL	RF switching pulse signal for REC/PB amp and Audio circuit. 25 Hz, 50% duty pulse.
100	0	H CHG	O	VA	Not used.

3-11. MODE CONTROL MICROPROCESSOR PIN FUNCTION (IC506 ON CS-37 BOARD: μPD75316)

Pin No.	Port Name	Signal	I/O	Connection	Function
1	S12	S12	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
2	S13	S13	O		
3	S14	S14	O		
4	S15	S15	O		
5	S16	S16	O		
6	S17	S17	O		
7	S18	S18	O		
8	S19	S19	O		
9	S20	S20	O		
10	S21	S21	O		
11	S22	S22	O		
12	S23	S23	O		
13	S24/BP0	EEPROM CS	O		Chip select signal to EEPROM (IC511 on CS-37 board). 1/2V period "L" pulse.
14	S25/BP1	TG STBY 1	O	CAM	Power save control signal to timing generator (IC801 on CS-37 board). Normally "L".
15	S26/BP2	AUDIO IN/OUT	O	AU	Audio input/output control signal. "H": input. "L": output.
16	S27/BP3		O		N.C.
17	S28/BP4	TITLE CS	O	CAM	Not used.
18	S29/BP5	REMO CS	O		Chip select signal to sircs remote controller (IC509 on CS-37 board). 1V period "L" pulse.
19	S30/BP6	S RAM CS	O		Not used.
20	S31/BP7	CAM COSM CS	O	CAM	Chip select signal to camera controller (IC709 on CS-37 board). 1V period "L" pulse.
21	COM0	COM 0	O		Common terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V)
22	COM1	COM 1	O		
23	COM2	COM 2	O		
24	COM3	COM 3	O		
25	BIAS	BIAS	O		Bias voltage output for voltage deviding resistor. Not used.
26	VLC0	VCC 0	I		Power source 0 input Power source for LCD dirve. Not used.
27	VLC1	VCC 1	I		Power source 1 input
28	VLC2	VCC 2	I		Power source 2 input
29	P40	K OUT 4	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
30	P41	K OUT 5	O	all	
31	P42	SYS RESET	O	all	Output signal to reset each IC when power is turned on. Normally "H".
32	P43	TALLY	O	EVF	Tally LED ON/OFF signal. "L": ON.
33	VSS	VSS			GND
34	P50	K OUT 0	O	all	KEY matrix output. 1V period "L" pulse output when corresponding key is pressed. "L" when other cases.
35	P51	K OUT 1	O	all	
36	P52	K OUT 2	O	all	
37	P53	K OUT 3	O	all	
38	P00/INT4	BATT IN	I		Clock select to 32 kHz when "L" and to 4.19 MHz with "H" when Battery is turned on. "L" is select.
39	P01/SCK	SCK	O	all	Serial clock output terminal, Serial clock (2 μS) communication.
40	P02/SO/SB0	DATA TO SLVE	O	all	Serial bus output terminal, Serial clock (2 μS) communication.
41	P03/SI/SB1	DATA TO MSTR	I	all	Serial bus input terminal, Serial clock (2 μS) communication.
42	P10/INT0	SYSTEM SYNC	I	all	(Edge detection vector interruption), System synchronization input port from CXP80624 (IC503 on CS-37 board).

Pin No.	Port Name	Signal	I/O	Connection	Function
43	P11/INT1	$\overline{\text{LI PRE END}}$	I		(Edge detection vector interruption), Lithium PRE END is selected with "L".
44	P12/INT2	$\overline{\text{LANC PWR ON}}$	I		Power on signal input from wired remote control. "L" when power switch pressed.
45	P13/TIO	TITLE BUSY	I	CAM	Not used.
46	P20/PT00	VTR ON	O	PS	VTR power source (SS5V, VIDEO 5V, AUDIO 5V, EVF 5V, D5V, D4V) control signal. "H" when power switch is in "PLAYER" or "CAMERA" position.
47	P21	CAM ON	O	PS	CAMERA power source (CAM 5V, +15V, –9V) control signal. "H" when power switch is in "CAMERA" position.
48	P22/PCL	$\overline{\text{VIDEO D/A CS}}$	O	VA	Serial data load signal to video circuit EVR (IC203, 204 on VA-77 board). 1V period "H" pulse.
49	P23/BUZ	BUZ	O		Buzzer output. Normally "L". 2 kHz pulse: alarm.
50	P30/LCDCL	$\overline{\text{VIDEO CS}}$	O	VA	Chip select signal to Y process IC (IC201 on VA-77 board). 1V period "L" pulse.
51	P31/SYNC	$\overline{\text{VTR COSM CS}}$	O		Chip select signal to mechanism controller (IC503 on CS-37 board). 1V period "L" pulse.
52	P32	$\overline{\text{SG CS}}$	O	CAM	Chip select signal to sync generator (IC704 on CS-37 board). 1V period "L" pulse.
53	P33	$\overline{\text{CRTC CS}}$	O	CAM	Strobe signal for character generator (IC703 on CS-37 board). 1V period "H" pulse.
54	VDD	VDD			VDD
55	XT1	XT1	I		SUB system clock. 32 kHz oscillation terminal.
56	XT2	XT2			
57	N.C.	N.C.			N.C.
58	X1	X1	I		Main system clock. 4.19 MHz oscillation terminal.
59	X2	X2	I		
60	P60/KK0	K IN 0	I	all	KEY matrix input. 1V period "L" pulse input when corresponding key is pressed. "H" when other case.
61	P61/KR1	K IN 1	I	all	
62	P62/KR2	K IN 2	I	all	
63	P63/KR3	K IN 3	I	all	
64	P70/KR4	K IN 4	I	all	
65	P71/KP5	K IN 5	I	all	
66	P72/KP6	K IN 6	I	all	Cassette compartment lock switch input. "L": Lock.
67	P73/KP7	$\overline{\text{CC DOWN}}$	I	MD	System reset input. "L": Reset, Normally: "H".
68	$\overline{\text{RESET}}$	$\overline{\text{RESET}}$	I		N.C.
69	S0	CLK CHK	O		Segment terminal drive signal to LCD. (Four value output of 0, 1.7, 3.3, 5V) Not used.
70	S1	S1	O		
71	S2	S2	O		
72	S3	S3	O		
73	S4	S4	O		
74	S5	S5	O		
75	S6	S6	O		
76	S7	S7	O		
77	S8	S8	O		
78	S9	S9	O		
79	S10	S10	O		
80	S11	S11	O		

3-12. INTERFACE

3-12-1. System Control – Video/Audio Block Interface (CS-37 BOARD)

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *3		REC *4	REC *4 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
SP/$\overline{\text{LP}}$	O	IC503 (93)	*1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*1	*2	*2	*16	H	H/L	*16	*2	*2	H	H
VA PB MODE	O	IC503 (97)	L	L	L	H	H	H	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE *13	O	IC503 ㊽	L	L	L	H	H	L	H	H	H	H	H	L	H	H	L	L	L	L	H	H	H	H
VIDEO MUTE	O	IC503 ㉒	*14	*14	*14	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*15	*14	*14	L	L	*15	*15	*15	*15
CAM/$\overline{\text{LINE}}$	O	IC503 ㉘	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L
JOG VD	O	IC503 ⑤	L	L	L	*5	*5	L	*5	*5	*5	*5	*5	*5	*5	*5	L	L	L	L	*5	*5	*5	*5
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{FE ON}}$	O	IC503 ④	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
RF SWP	O	IC503 (99)	L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
JOG	O	IC503 ⑥	L	L	L	H	H	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
$\overline{\text{VIDEO CS}}$	O	IC506 ㊿	V period "L" pulse																					
$\overline{\text{VIDEO D/A CS}}$	O	IC506 ㊽	V period 'H" pulse																					
DATA TO MSTR	I	IC506 ㊶	V period "L" pulse																					
DATA TO SLVE	O	IC506 ㊵	V period pulse train																					
SCK	I	IC506 ㊴	V period "H" pulse																					
PB SP/$\overline{\text{LP}}$ DET	I	IC503 (67)	L	*10	*10	*10	*10	L	*10	*10	*10			*10	L	*10	H	H	H	H	L	*10	L	*10
CLOG	I	IC503 (84)	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H	*11	*11	H	*11	*11	*11	*11
VTR SYNC	I	IC503 (66)	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs discrimination result of the mode just before. "H": SP mode, "L": LP mode.
*2. Outputs discrimination result of the playback tape. "H" : SP mode, "L": LP mode.
*3. Edit search button pressed when playback pause mode.
*4. Mode for adjustment.
*5. False VD signal
*7. 25 Hz duty 50% pulse (synchronized with drum rotation)
*10. "H": SP recording area on tape. "L": LP recording area.
*11. "H": no recording area or drop out area on tape. Head clog detection input.
*12. Composite sync signal input separated from line input video signal, camera video signal or playback video signal. (polarity +)
*13. "H" during camera mode load/unload.
*14. "L" when external input (video) present. "H" when other cases.
*15. "H" when tape no signal. "L" when other cases.
*16. By REC MODE switch. "H": SP mode, "L": LP mode.

3-12-2. System Control – Servo Block Interface

NAME	I/O	No.	VTR MODE																CAMERA MODE					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB· PAUSE	FRAME	SLOW	X2	SHUTTLE EDIT *13		REC *14	REC *14 PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW					FWD	REV					FWD	RVS	FWD	RVS
T.REEL FG	I	IC503 (62)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	IC503 (61)	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	IC503 (60)	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	IC503 (68)	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	IC503 (69)	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG/ CFG HMS	I	IC503 (70), (77)	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	IC503 ①	L	H	H	H	H	H	H	H	L	*8	*8	H	H	H	H	L	L	H	H	H	H	H
REF PILOT	O	IC503 (85)	*7	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RP PB MODE	O	IC503 ③	H	H	H	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
DRUM FWD/$\overline{\text{RVS}}$ *10	O	IC503 ㉟	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
CAP FWD/ $\overline{\text{RVS}}$	O	IC503 ②	L	H	L	H	L	H	H	L	L	*8	*8	H	H	L	H	L	L	H	H	L	H	L
DRUM PWM	O	IC503 (76)	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
CAP PWM	O	IC503 (75)	L	*9	*9	*9	*9	*9	*9	*9	L	*9	*9	*9	*9	*9	*9	L	L	*9	*9	*9	*9	*9
$\overline{\text{LM LIM CONT}}$ *11	O	IC503 ㉝	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON *12	O	IC503 (83)	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
DRUM ACC	O	IC503 (91)	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L
DRUM BRK	O	IC503 (92)	L	L	L	L	L	L	L	L	L	L	*8	L	L	L	L	L	L	L	L	L	L	L

*1. Inputting waveform which is similar to sine wave according to reel rotation.

*2. ATF error voltage input

*3. One PG pulse input per one drum rotation, approx. 25 Hz.

*4. 12 FG pulses input per one drum rotation, approx. 300 Hz.

*5. 520 FG pulses input per one capstan rotation. Approx. 1389 Hz when REC/PB (SP). 697 Hz when PB (LP).

*6. Four frequencies output synchronized with drum rotation. f1=101.02 kHz, f2=117.19 kHz, f3=162.76 kHz and f4=146.48 kHz

*7. f2 (117.19 kHz) output

*8. "H" pulse when tape run.

*9. 21.5 μsec period PWM signal

*10. Normally "H". Temporary "L" when load (drum reverse rotation).

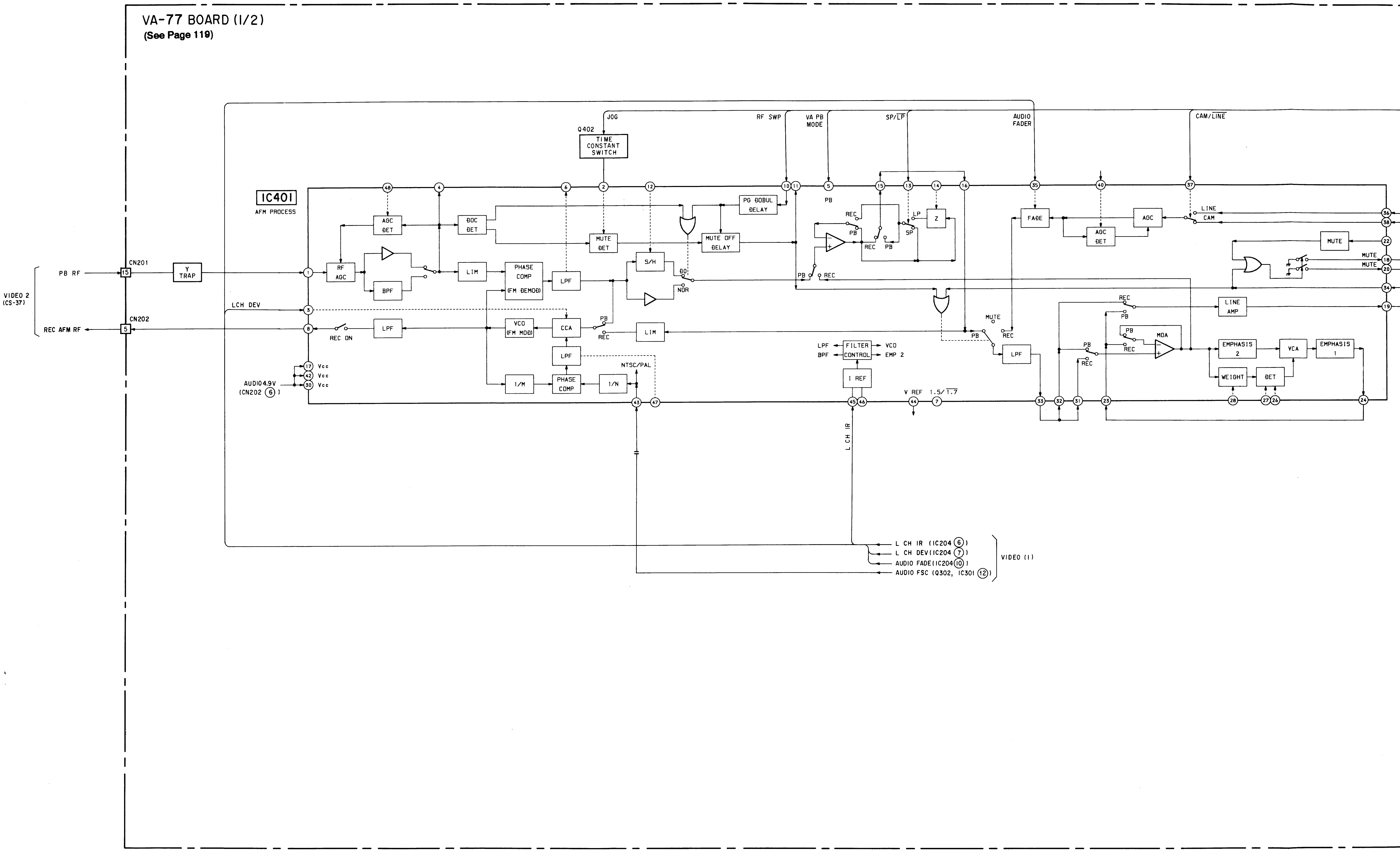
*11. Temporary "H" when cassette loading (finger catch protection).

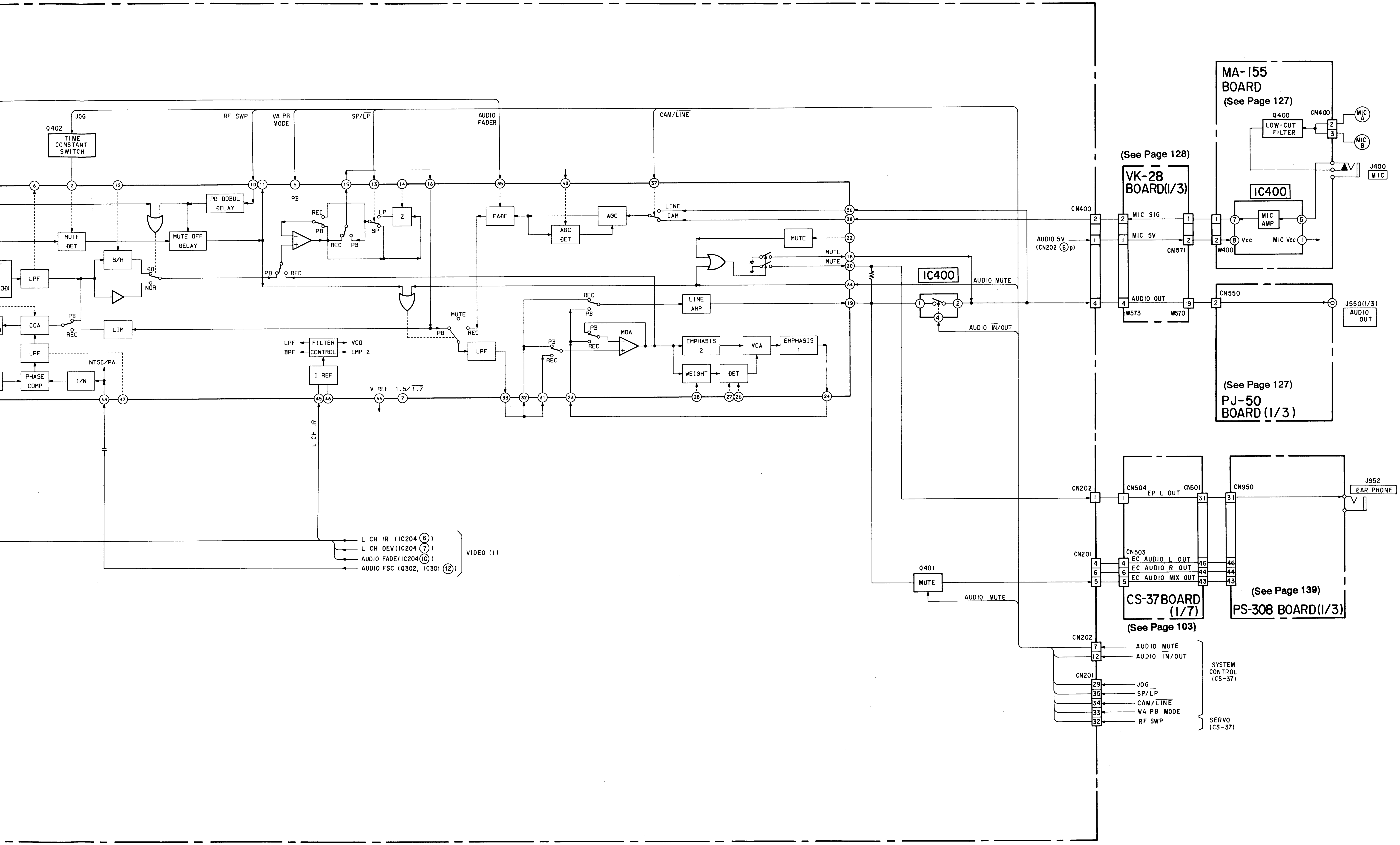
*12. "H": approx. 1.3 Vdc

*13. Edit search button pressed when playback pause mode.

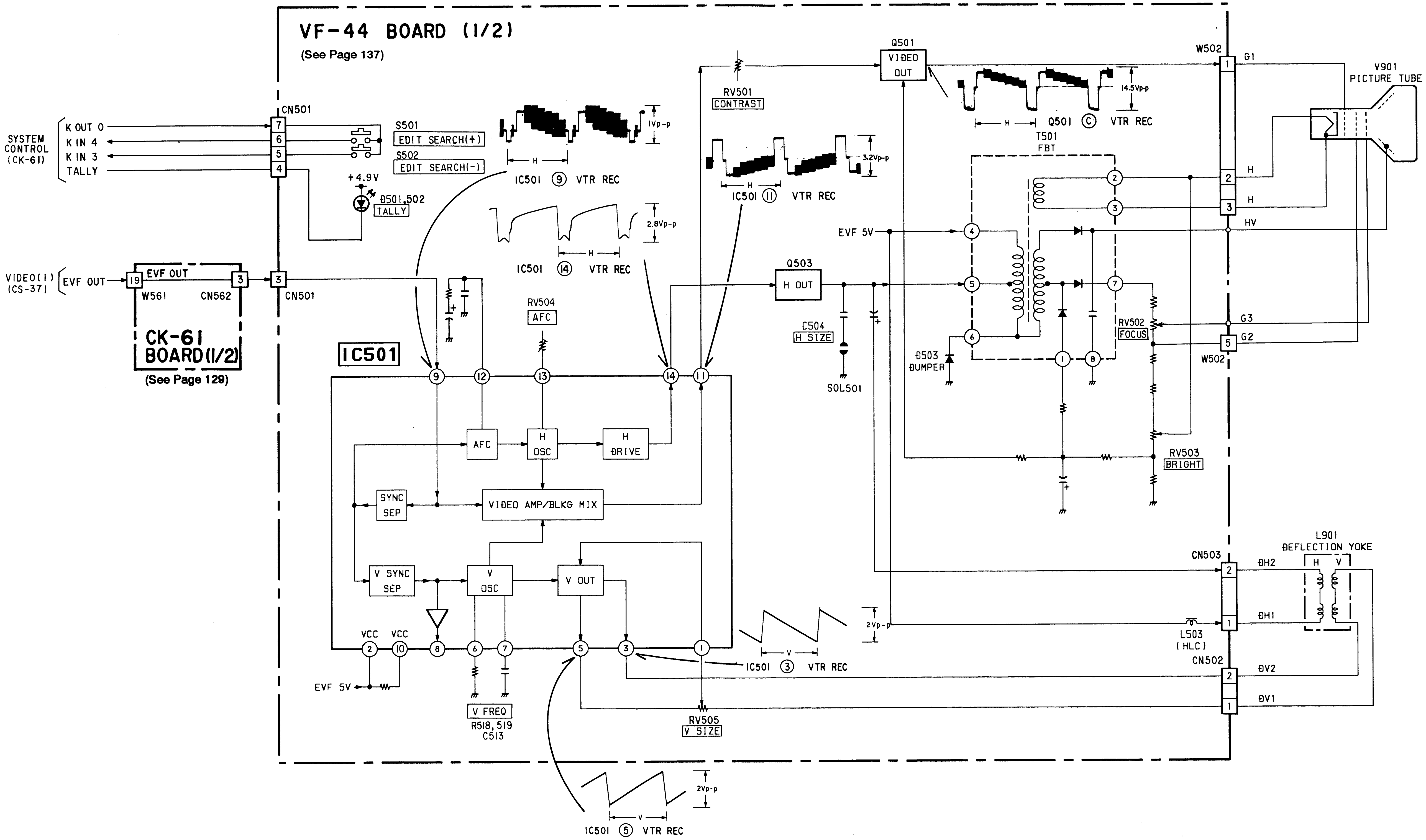
*14. Mode for adjustment

3-13. AUDIO BLOCK DIAGRAM

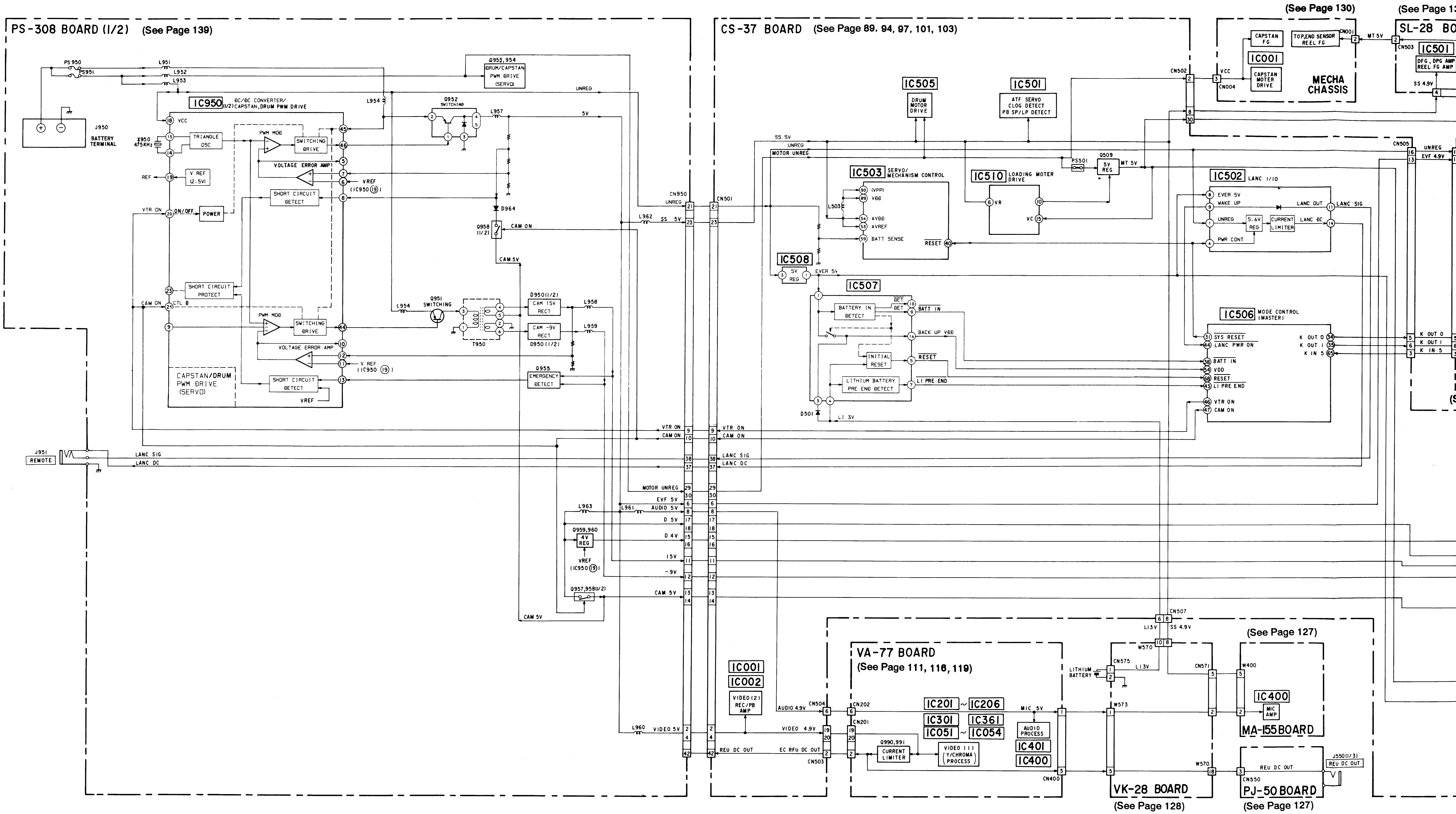

VA-77 BOARD (1/2)
(See Page 119)
IC401
AFM PROCESS
VIDEO 2 (CS-37)
PB RF
REC AFM RF
CN201
CN202
Y TRAP
LCH DEV
REC ON
RF AGC
AGC DET
BPF
LIM
PHASE COMP (FM DEMOD)
LPF
DOC DET
MUTE DET
S/H
BO
NOR
PG DOBUL DELAY
MUTE OFF DELAY
Q402
TIME CONSTANT SWITCH
JOG
RF SWP
VA PB MODE
SP/LP
AUDIO FADER
CAM/LINE
VCO (FM MOD)
CCA
PB
REC
1/M
1/N
NTSC/PAL
AUDIO4.9V (CN202 ⑥)
Vcc
LP
SP
Z
FILTER CONTROL
LPF
BPF
VCO
EMP 2
I REF
V REF 1.5/1.7
L CH IR
MUTE
FADE
AGC
LINE
CAM
LINE AMP
MOA
EMPHASIS 2
VCA
EMPHASIS 1
WEIGHT
DET
L CH IR (IC204 ⑥)
L CH DEV(IC204 ⑦)
AUDIO FADE(IC204 ⑩)
AUDIO FSC (Q302, IC301 ⑫)
VIDEO (1)

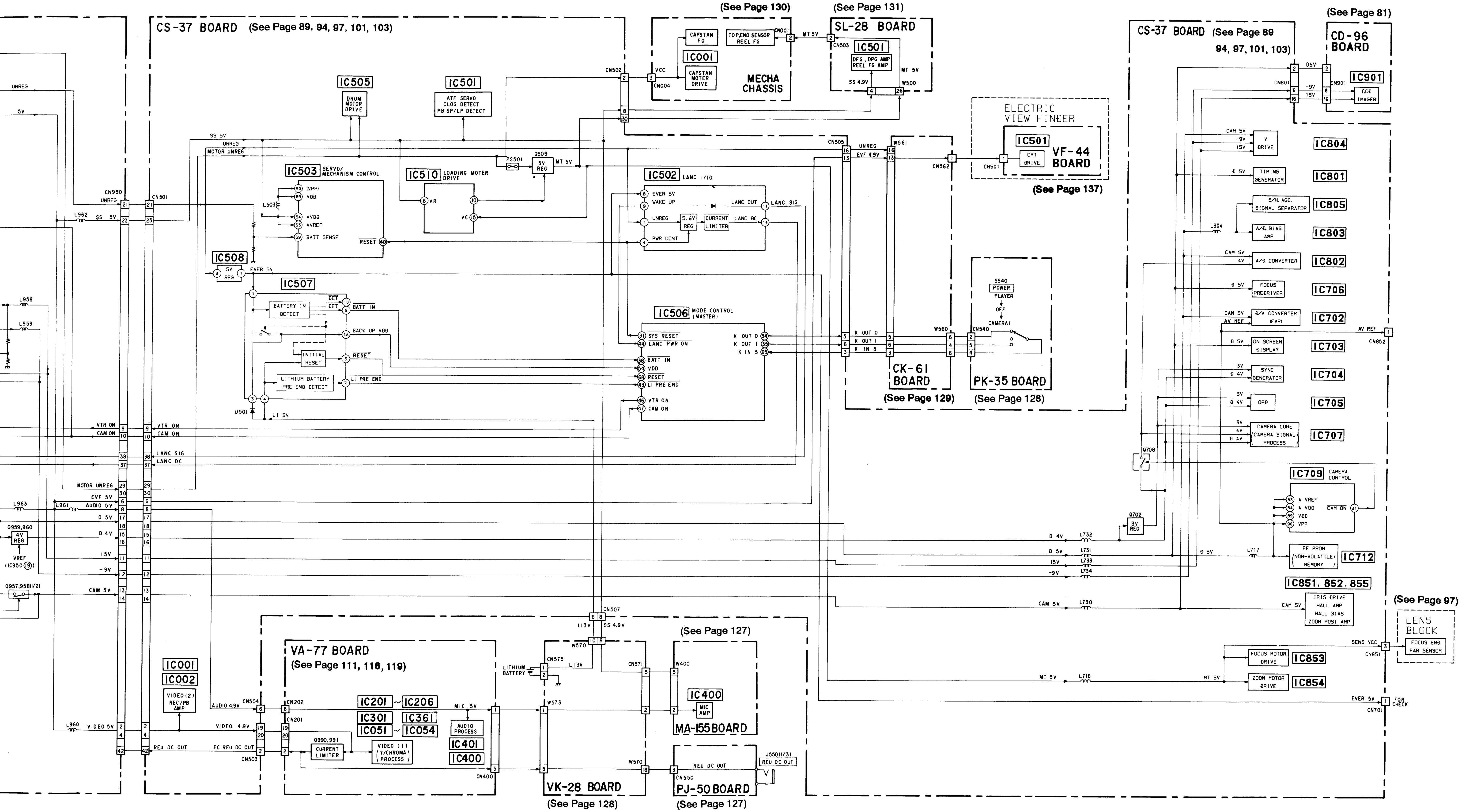

JOG
Q402
TIME CONSTANT SWITCH
RF SWP
VA PB MODE
SP/LP
AUDIO FADER
CAM/LINE
PB
PG DOBUL DELAY
MUTE DET
MUTE OFF DELAY
S/H
BD
NOR
LPF
CCA
LIM
LPF
PHASE COMP
1/N
NTSC/PAL
REC
PB
LP
SP
Z
FADE
AGC
AGC DET
LINE
CAM
MUTE
MUTE
MUTE
LINE AMP
REC
PB
MOA
EMPHASIS 2
VCA
EMPHASIS 1
WEIGHT
DET
LPF
FILTER CONTROL
VCO
EMP 2
BPF
I REF
V REF 1.5/1.7
L CH IR
L CH IR (IC204 ⑥)
L CH DEV (IC204 ⑦)
AUDIO FADE (IC204 ⑩)
AUDIO FSC (Q302, IC301 ⑫)
VIDEO (1)
IC400
AUDIO MUTE
AUDIO IN/OUT
Q401
MUTE
AUDIO MUTE
CN400
AUDIO 5V (CN202 ⑥p)
(See Page 128)
VK-28 BOARD (1/3)
MIC SIG
MIC 5V
AUDIO OUT
CN571
W573
W570
MA-155 BOARD
(See Page 127)
Q400
LOW-CUT FILTER
CN400
MIC A
MIC B
J400 MIC
IC400
MIC AMP
Vcc
MIC Vcc
W400
CN550
J550 (1/3) AUDIO OUT
(See Page 127)
PJ-50 BOARD (1/3)
CN202
CN504
EP L OUT
CN501
CN950
J952 EAR PHONE
CN201
CN503
EC AUDIO L OUT
EC AUDIO R OUT
EC AUDIO MIX OUT
CS-37 BOARD (1/7)
(See Page 103)
(See Page 139)
PS-308 BOARD (1/3)
CN202
AUDIO MUTE
AUDIO IN/OUT
SYSTEM CONTROL (CS-37)
CN201
JOG
SP/LP
CAM/LINE
VA PB MODE
RF SWP
SERVO (CS-37)

3-14. EVF BLOCK DIAGRAM


VF-44 BOARD (1/2)
(See Page 137)
SYSTEM CONTROL (CK-61)
K OUT 0
K IN 4
K IN 3
TALLY
CN501
S501
EDIT SEARCH(+)
S502
EDIT SEARCH(-)
+4.9V
D501,502
TALLY
VIDEO(1) (CS-37)
EVF OUT
EVF OUT
W561
CN562
CK-61 BOARD(1/2)
(See Page 129)
IC501
1Vp-p
IC501 ⑨ VTR REC
2.8Vp-p
IC501 ⑭ VTR REC
RV504
AFC
RV501
CONTRAST
3.2Vp-p
IC501 ⑪ VTR REC
Q501
VIDEO OUT
14.5Vp-p
Q501 ⓒ VTR REC
T501
FBT
W502
G1
V901
PICTURE TUBE
H
H
HV
EVF 5V
Q503
H OUT
C504
H SIZE
SOL501
D503
DUMPER
RV502
FOCUS
G3
G2
W502
RV503
BRIGHT
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
VCC
VCC
EVF 5V
V FREQ
R518, 519
C513
RV505
V SIZE
2Vp-p
IC501 ③ VTR REC
L901
DEFLECTION YOKE
CN503
DH2
DH1
L503
(HLC)
CN502
DV2
DV1
2Vp-p
IC501 ⑤ VTR REC

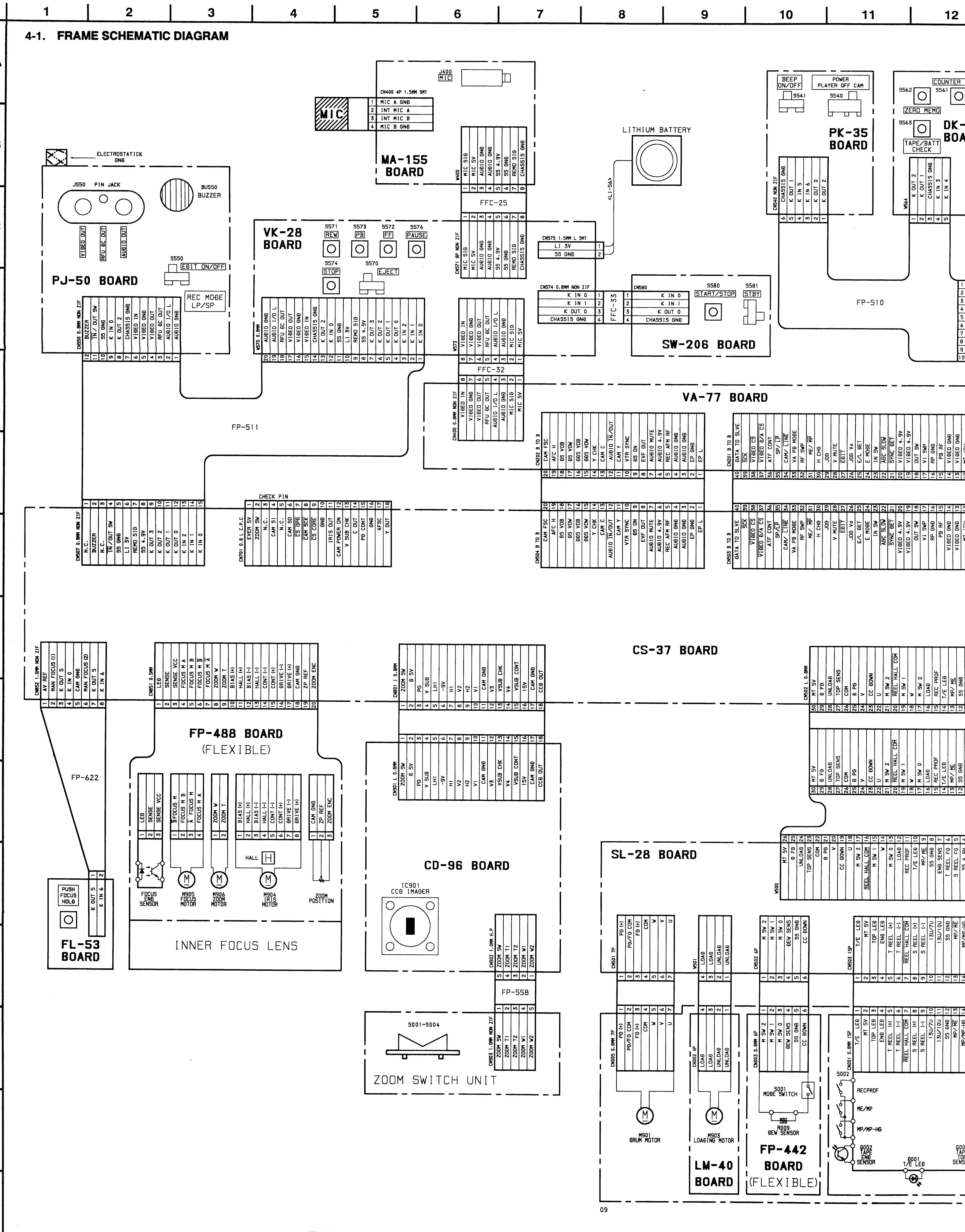
3-15. POWER BLOCK DIAGRAM


PS-308 BOARD (1/2) (See Page 139)
CS-37 BOARD (See Page 89, 94, 97, 101, 103)
(See Page 130)
MECHA CHASSIS
CAPSTAN FG
TOP,END SENSOR REEL FG
IC001
CAPSTAN MOTER DRIVE
SL-28 BO
IC501
DFG, DPG AMP REEL FG AMP
MT 5V
SS 4.9V
J950
BATTERY TERMINAL
PS950
PS951
L951
L952
L953
X950 475KHz
IC950
DC/DC CONVERTER/ (1/2) CAPSTAN,DRUM PWM DRIVE
Q953,954 DRUM/CAPSTAN PWM DRIVE (SERVO)
UNREG
L954
Q952 SWITCHING
L957
5V
VCC
TRIANGLE OSC
PWM MOD
SWITCHING DRIVE
VOLTAGE ERROR AMP
V REF (2.5V)
REF
VREF (IC950 ⑲)
SHORT CIRCUIT DETECT
VTR ON
ON/OFF
POWER
D964
Q958 (1/2)
CAM ON
CAM 5V
SHORT CIRCUIT PROTECT
CTL B
Q951 SWITCHING
D950(1/2) CAM 15V RECT
L958
CAM -9V RECT
D950(1/2)
L959
T950
Q955 EMERGENCY DETECT
CAPSTAN/DRUM PWM DRIVE (SERVO)
VREF
J951 REMOTE
LANC SIG
LANC DC
CN950
L962
SS 5V
MOTOR UNREG
EVF 5V
AUDIO 5V
L963
L961
D 5V
D 4V
Q959,960 4V REG
15V
-9V
Q957,958(1/2)
CAM 5V
L960
VIDEO 5V
CN501
IC505 DRUM MOTOR DRIVE
IC501 ATF SERVO CLOG DETECT PB SP/LP DETECT
SS 5V
UNREG
MOTOR UNREG
IC503 SERVO/ MECHANISM CONTROL
(VPP)
VDD
L503
AVDD
AVREF
BATT SENSE
RESET
IC510 LOADING MOTER DRIVE
VR
VC
PS501
Q509 5V REG
MT 5V
CN502
CN004
IC508 5V REG
EVER 5V
IC507
BATTERY IN DETECT
DET
BATT IN
BACK UP VDD
INITIAL RESET
RESET
LITHIUM BATTERY PRE END DETECT
LI PRE END
D501
LI 3V
IC502 LANC 1/10
EVER 5V
WAKE UP
LANC OUT
LANC SIG
UNREG
5.6V REG
CURRENT LIMITER
LANC DC
PWR CONT
IC506 MODE CONTROL (MASTER)
SYS RESET
LANC PWR ON
BATT IN
VDD
RESET
LI PRE END
VTR ON
CAM ON
K OUT 0
K OUT 1
K IN 5
CN505
UNREG
EVF 4.9V
CN503
CN507
LI 3V
SS 4.9V
IC001
IC002
VIDEO (2) REC/PB AMP
AUDIO 4.9V
CN504
VIDEO 4.9V
REU DC OUT
EC RFU DC OUT
VA-77 BOARD (See Page 111, 116, 119)
CN202
CN201
IC201 ~ IC206
IC301 IC361
IC051 ~ IC054
MIC 5V
AUDIO PROCESS
IC401
IC400
Q990,991 CURRENT LIMITER
VIDEO (1) (Y/CHROMA PROCESS)
CN400
W570
LITHIUM BATTERY
CN575
CN571
W573
VK-28 BOARD (See Page 128)
(See Page 127)
W400
IC400
MIC AMP
MA-155 BOARD
J550(1/3) REU DC OUT
CN550
PJ-50 BOARD (See Page 127)

CS-37 BOARD (See Page 89, 94, 97, 101, 103)
(See Page 130)
MECHA CHASSIS
CAPSTAN FG
TOP,END SENSOR REEL FG
IC001
CAPSTAN MOTER DRIVE
(See Page 131)
SL-28 BOARD
IC501
DFG, DPG AMP REEL FG AMP
MT 5V
SS 4.9V
IC505
DRUM MOTOR DRIVE
IC501
ATF SERVO CLOG DETECT PB SP/LP DETECT
IC503 SERVO/ MECHANISM CONTROL
IC510 LOADING MOTER DRIVE
IC502 LANC I/O
IC508 5V REG
IC507
BATTERY IN DETECT
INITIAL RESET
LITHIUM BATTERY PRE END DETECT
IC506 MODE CONTROL (MASTER)
SYS RESET
LANC PWR ON
BATT IN
VDD
RESET
LI PRE END
VTR ON
CAM ON
K OUT 0
K OUT 1
K IN 5
EVER 5V
WAKE UP
UNREG
PWR CONT
LANC OUT
LANC SIG
LANC DC
5.6V REG
CURRENT LIMITER
Q509 5V REG
PS501
SS 5V
MOTOR UNREG
ELECTRIC VIEW FINDER
IC501 CRT DRIVE
VF-44 BOARD
(See Page 137)
S540 POWER PLAYER OFF CAMERA
CK-61 BOARD
(See Page 129)
PK-35 BOARD
(See Page 128)
CS-37 BOARD (See Page 89 94, 97, 101, 103)
(See Page 81)
CD-96 BOARD
IC901 CCD IMAGER
V DRIVE IC804
TIMING GENERATOR IC801
S/H, AGC, SIGNAL SEPARATOR IC805
A/G BIAS AMP IC803
A/D CONVERTER IC802
FOCUS PREDRIVER IC706
D/A CONVERTER (EVR) IC702
ON SCREEN DISPLAY IC703
SYNC GENERATOR IC704
OPD IC705
CAMERA CORE (CAMERA SIGNAL PROCESS) IC707
IC709 CAMERA CONTROL
Q708
Q702 3V REG
EE PROM (NON-VOLATILE MEMORY) IC712
IC851, 852, 855
IRIS DRIVE HALL AMP HALL BIAS ZOOM POSI AMP
(See Page 97)
LENS BLOCK
FOCUS END FAR SENSOR
FOCUS MOTOR DRIVE IC853
ZOOM MOTOR DRIVE IC854
EVER 5V FOR CHECK
VA-77 BOARD (See Page 111, 116, 119)
IC201 ~ IC206
IC301 IC361
IC051 ~ IC054
AUDIO PROCESS
IC401
IC400
VIDEO (1) Y/CHROMA PROCESS
Q990,991 CURRENT LIMITER
IC001
IC002
VIDEO (2) REC/PB AMP
LITHIUM BATTERY
VK-28 BOARD (See Page 128)
(See Page 127)
IC400 MIC AMP
MA-155 BOARD
PJ-50 BOARD (See Page 127)
REU DC OUT
J550(1/3)
VTR ON
CAM ON
D 4V
D 5V
15V
-9V
CAM 5V
MT 5V
VIDEO 5V
AUDIO 5V
EVF 5V
VREF (IC950 ⑲)
Q959,960 4V REG
Q957,958(1/2)

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM



1
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9
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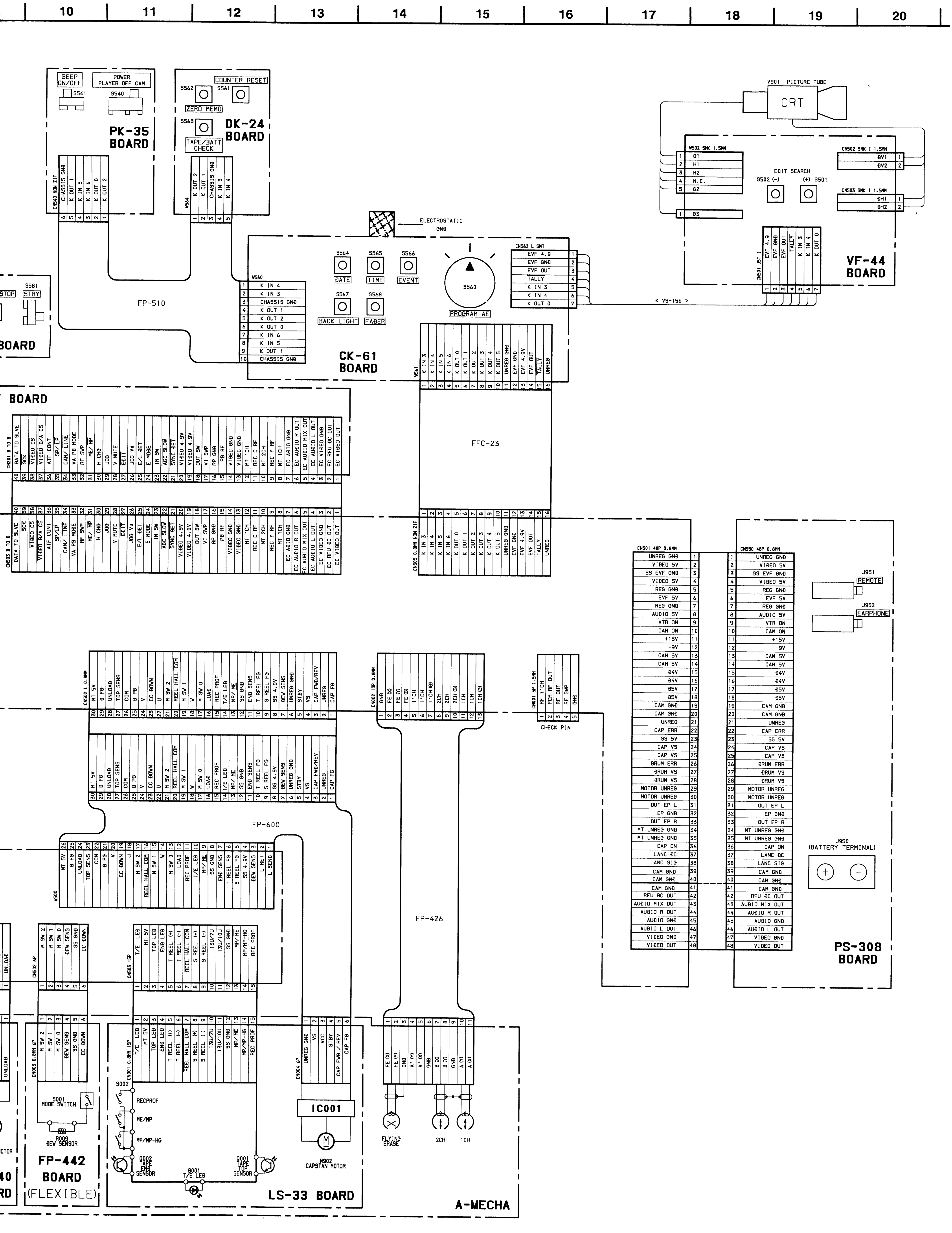
11
12
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
PJ-50 BOARD
ELECTROSTATICK GND
J550 PIN JACK
VIDEO OUT
RFU DC OUT
AUDIO OUT
BU550 BUZZER
S550
EDIT ON/OFF
REC MODE LP/SP
CN550 0.8MM NON ZIF
MA-155 BOARD
MIC
J400 MIC
CN400 4P 1.5MM SMT
MIC A GND
INT MIC A
INT MIC B
MIC B GND
W400
FFC-25
VK-28 BOARD
S571 REW
S573 PB
S572 FF
S576 PAUSE
S574 STOP
S570 EJECT
W570 0.8MM
CN571 8P NON ZIF
W573
FFC-32
LITHIUM BATTERY
<LI-56>
CN575 1.5MM L SMT
LI 3V
SS GND
CN574 0.8MM NON ZIF
FFC-33
CN580
SW-206 BOARD
S580 START/STOP
S581 STBY
PK-35 BOARD
BEEP ON/OFF
S541
POWER PLAYER OFF CAM
S540
CN540 NON ZIF
DK- BOA
COUNTER
S562
S561
ZERO MEMO
S563
TAPE/BATT CHECK
W564
FP-510
FP-511
VA-77 BOARD
CN400 0.8MM NON ZIF
CN202 B TO B
CN201 B TO B
CN504 B TO B
CN503 B TO B
CN507 0.8MM NON ZIF
CN701 0.8 L C.P.C
CHECK PIN
CS-37 BOARD
CN852 1.0MM NON ZIF
CN851 0.5MM
CN801 I 0.8MM
CN502 L 0.8MM
FP-622
FP-488 BOARD (FLEXIBLE)
FOCUS END SENSOR
M905 FOCUS MOTOR
M906 ZOOM MOTOR
HALL
M904 IRIS MOTOR
ZOOM POSITION
INNER FOCUS LENS
FL-53 BOARD
PUSH FOCUS HOLD
CD-96 BOARD
IC901 CCD IMAGER
CN901 L 0.8MM
CN902 1.0MM H.P
FP-558
CN903 1.0MM NON ZIF
S001~S004
ZOOM SWITCH UNIT
SL-28 BOARD
W500
CN501 7P
W501
CN502 6P
CN503 15P
CN005 0.8MM 7P
CN002 4P
CN003 0.8MM 6P
CN001 0.8MM 15P
M901 DRUM MOTOR
M903 LOADING MOTOR
LM-40 BOARD
S001 MODE SWITCH
R009 DEW SENSOR
FP-442 BOARD (FLEXIBLE)
S002
RECPROF
ME/MP
MP/MP-HG
Q002 TAPE END SENSOR
D001 T/E LED
Q00 TAP TOP SENS
09

FRAME FRAME


10
11
12
13
14
15
16
17
18
19
20
PK-35 BOARD
BEEP ON/OFF S541
POWER PLAYER OFF CAM S540
CN540 NON ZIF
DK-24 BOARD
COUNTER RESET S561
ZERO MEMO S562
TAPE/BATT CHECK S563
W564
CK-61 BOARD
W560
DATE S564
TIME S565
EVENT S566
BACK LIGHT S567
FADER S568
PROGRAM AE S560
CN562 L SMT
W561
ELECTROSTATIC GND
FP-510
FFC-23
CN505 0.8MM NON ZIF
CN201 B TO B
CN503 B TO B
VF-44 BOARD
V901 PICTURE TUBE
CRT
W502 SMK 1.5MM
CN502 SMK 1.5MM
CN503 SMK 1.5MM
CN501 JST 1
EDIT SEARCH
S502 (–)
(+) S501
< VS-156 >
STOP
STBY
S581
BOARD
CN502 L 0.8MM
CN002 13P 0.8MM
CN001 5P 1.5MM
CHECK PIN
FP-600
W500
FP-426
CN502 6P
CN503 15P
CN003 0.8MM 6P
CN001 0.8MM 15P
CN004 6P
S001 MODE SWITCH
R009 BEW SENSOR
FP-442 BOARD (FLEXIBLE)
S002
RECPROF
ME/MP
MP/MP-HG
Q002 TAPE END SENSOR
D001 T/E LED
Q001 TAPE TOP SENSOR
IC001
M902 CAPSTAN MOTOR
LS-33 BOARD
FLYING ERASE
2CH
1CH
A-MECHA
CN501 48P 0.8MM
CN950 48P 0.8MM
J951 REMOTE
J952 EARPHONE
J950 (BATTERY TERMINAL)
PS-308 BOARD

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.

(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○ : Through hole
- ▨ : Pattern from the side which enables seeing.
  (The other layer's patterns are not indicated.)

* Caution:	
Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : nonflammable resistor.
- ▭ : fusible resistor.
- ☐ : panel designation.
- △ : internal component.
- ☐ : adjustment for repeair.*
- ━ : B+ Line.*
- ╍ : B– Line.*
- ⇨ : IN/OUT direction of (+, –) B LINE.*
- Circled numbers refer to waveforms.*

Note:
The components identi- fied by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

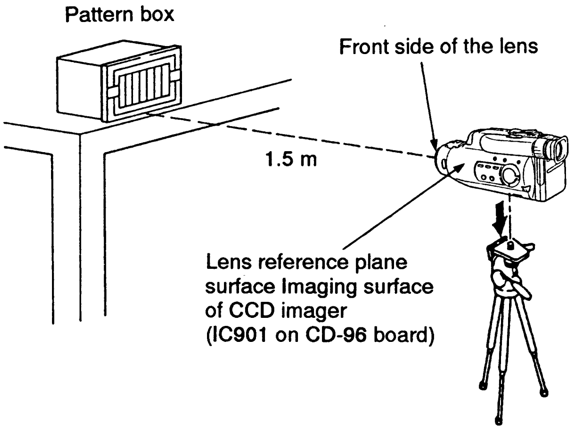
When indicating parts by reference number, please include the board name.

- **Measuring conditions voltage value and waveform.**

(CAMERA, DIGITAL TITLE block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points.* Readings are taken with a digital multimeter (DC 10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

1. Connection


Pattern box
Front side of the lens
1.5 m
Lens reference plane surface Imaging surface of CCD imager (IC901 on CD-96 board)

2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

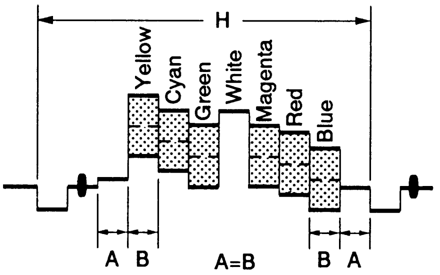

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A

Fig. a (Video output terminal output waveform)

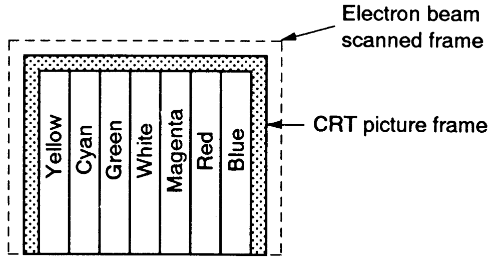

Electron beam scanned frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. (Picture on monitor TV)

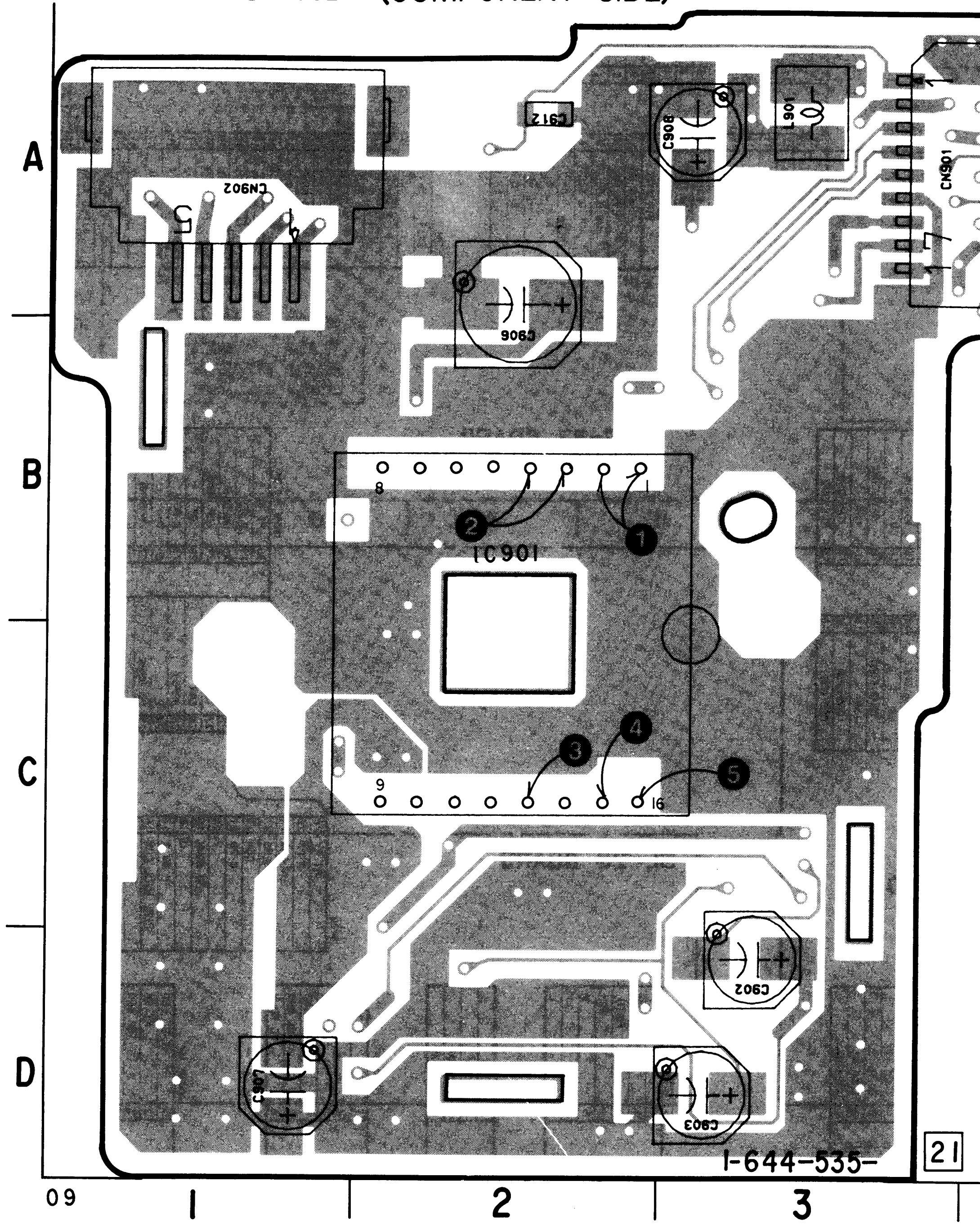
(VIDEO, SERVO/SYSTEM CONTROL, VIEW FINDER block)

- Voltages are dc between ground and measurement points.*
- Readings are taken with a color-bar signal input.*
- Readings are taken with a digital multimeter (DC10MΩ).*
- Voltage variations may be noted due to normal production tolerances.*

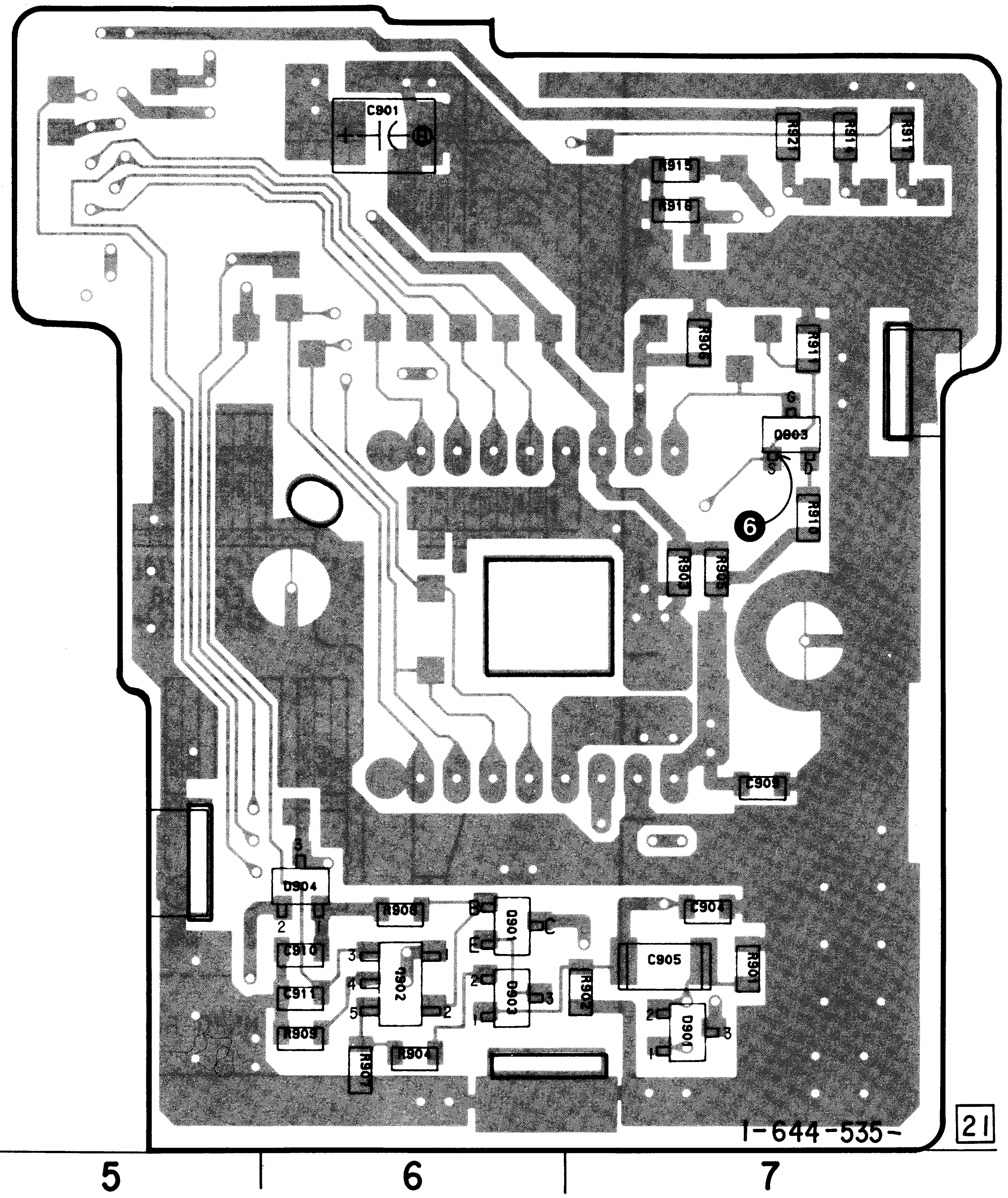
*: indicated by the color red.

— Ref. No. CD-96 BOARD: 1000 series —

CD-96 BOARD (COMPONENT SIDE)


A
B
C
D
09
1
2
3
CN902
C912
C906
L901
CN901
C908
IC901
8
1
9
16
①
②
③
④
⑤
C902
C903
1-644-535-
21

CD-96 BOARD (CONDUCTOR SIDE)


4
5
6
7
C901
R915
R916
R905
D903
R910
⑥
R909
R908
C909
D904
R906
Q901
C910
Q902
C911
R905
R904
Q903
R902
C905
C904
D901
1-644-535-
21

〈 DIODE 〉

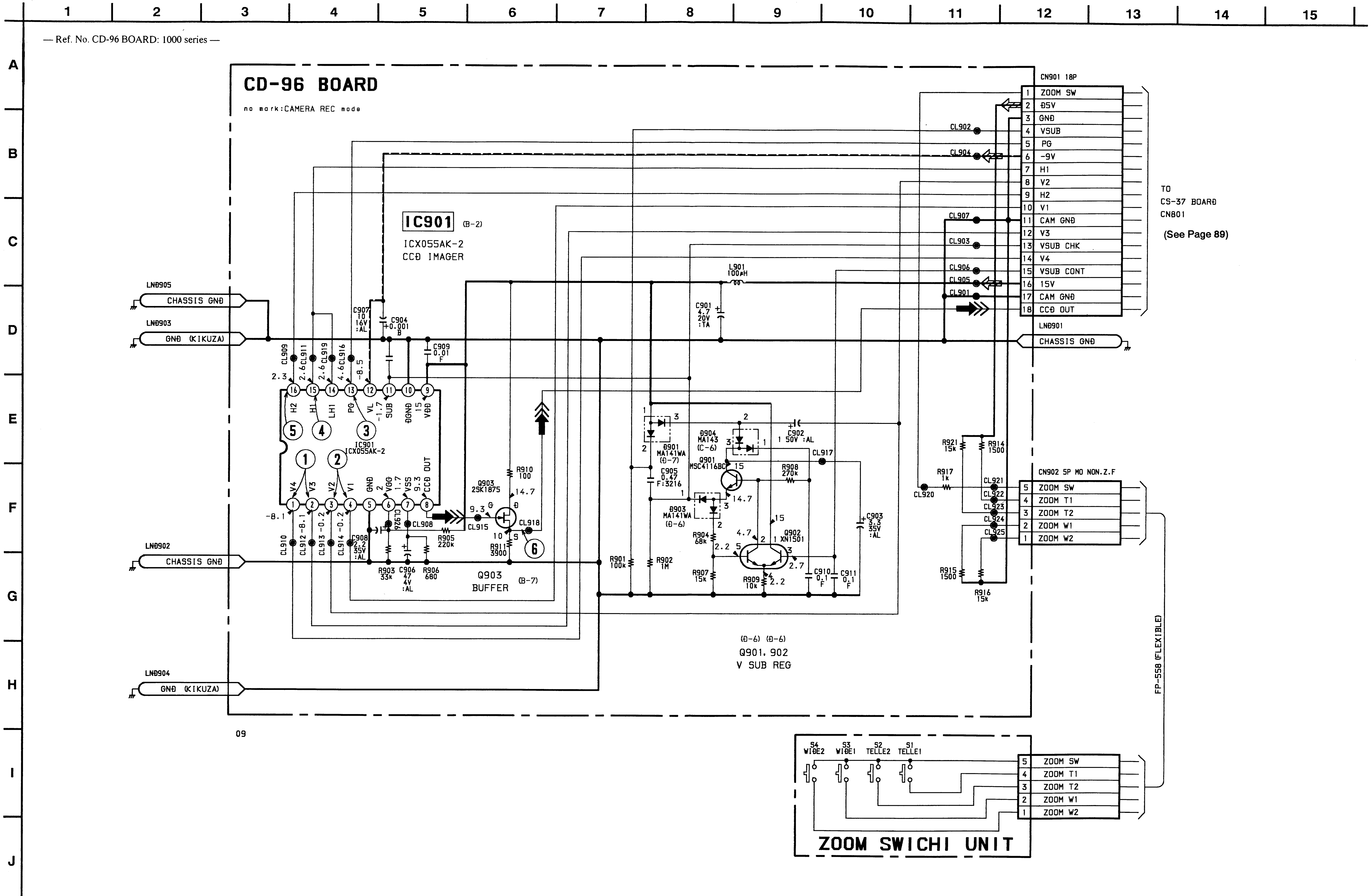
D901	8-719-820-05	DIODE	1SS181
D903	8-719-820-05	DIODE	1SS181
D904	8-719-800-76	DIODE	1SS226

〈 TRANSISTOR 〉

Q901	8-729-602-21	TRANSISTOR	2SC4154-F
Q902	8-729-402-13	TRANSISTOR	XN1501
Q903	8-729-232-86	TRANSISTOR	2SK1875

CD-96 (CCD DRIVE) SCHEMATIC DIAGRAM

— Ref. No. CD-96 BOARD: 1000 series —


1
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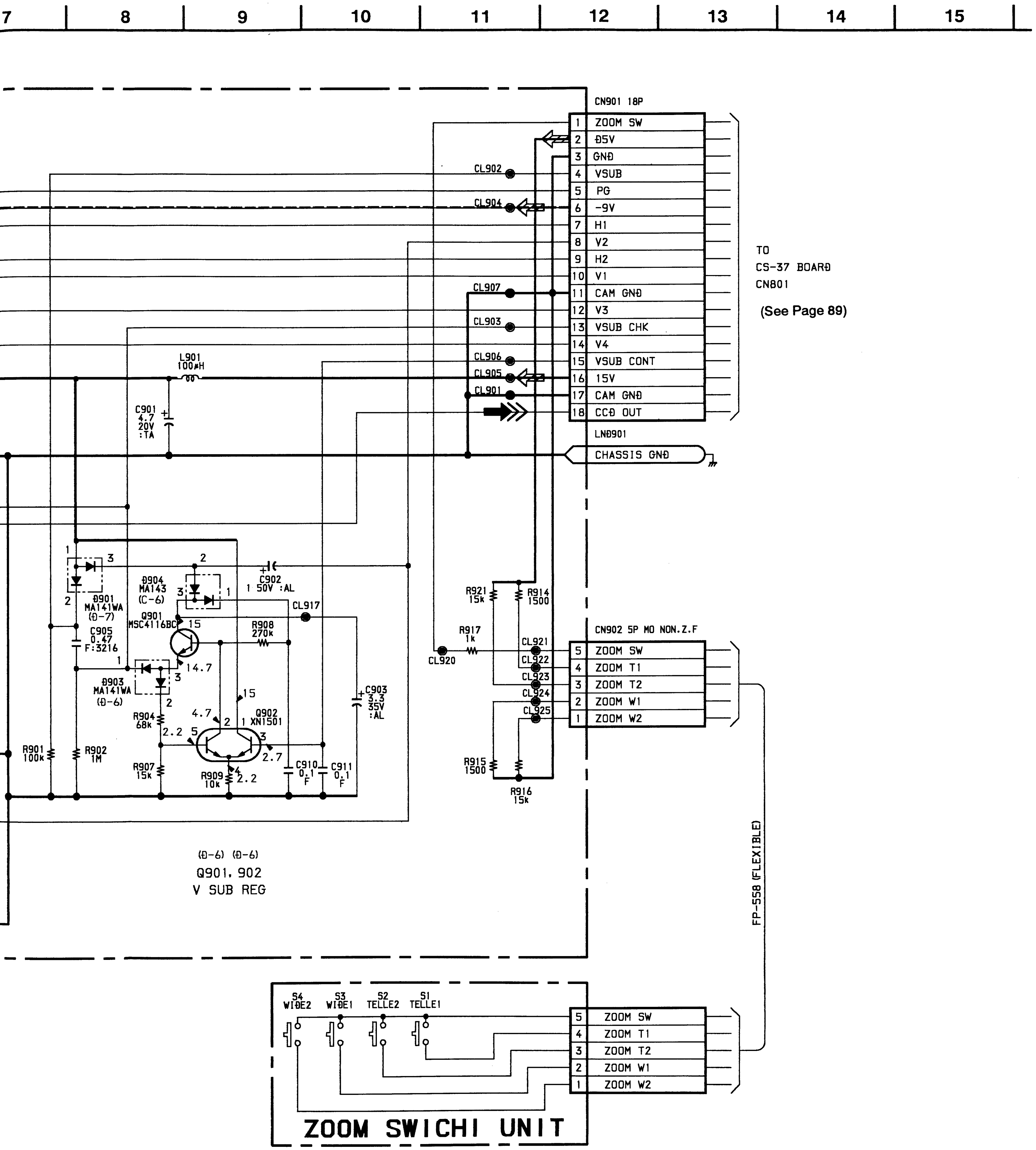
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
CD-96 BOARD
no mark:CAMERA REC mode
IC901 (B-2)
ICX055AK-2
CCD IMAGER
IC901
ICX055AK-2
H2
H1
LH1
PG
VL
-1.7
SUB
ĐGND
15
VĐĐ
V4
V3
V2
V1
GND
2
VGG
1.7
VSS
9.3
CCĐ OUT
-8.1
2.3
2.6CL911
2.6CL919
4.6CL916
-8.5
CL909
CL910
CL912 -8.1
CL913 -0.2
CL914 -0.2
CL926
CL908
C908 2.2 35V :AL
C907 10 16V :AL
C904 +0.001 B
C909 0.01 F
R903 33k
C906 47 4V :AL
R906 680
R905 220k
Q903 2SK1875
Q903 BUFFER (B-7)
R910 100
14.7
9.3
CL915
CL918
R911 3900
10
LNĐ905
CHASSIS GNĐ
LNĐ903
GNĐ (KIKUZA)
LNĐ902
CHASSIS GNĐ
LNĐ904
GNĐ (KIKUZA)
L901 100µH
C901 4.7 20V :TA
R901 100k
R902 1M
Đ901 MA141WA (Đ-7)
C905 0.47 F:3216
Đ903 MA141WA (Đ-6)
Đ904 MA143 (C-6)
Q901 MSC4116BC
C902 1 50V :AL
CL917
R908 270k
14.7
R904 68k
R907 15k
Q902 XN1501
R909 10k
4.7
2.2
2.7
15
C910 0.1 F
C911 0.1 F
C903 3.3 35V :AL
(Đ-6) (Đ-6)
Q901, 902
V SUB REG
09
CL902
CL904
CL907
CL903
CL906
CL905
CL901
CN901 18P
1 ZOOM SW
2 ĐSV
3 GNĐ
4 VSUB
5 PG
6 -9V
7 H1
8 V2
9 H2
10 V1
11 CAM GNĐ
12 V3
13 VSUB CHK
14 V4
15 VSUB CONT
16 15V
17 CAM GNĐ
18 CCĐ OUT
LNĐ901
CHASSIS GNĐ
TO
CS-37 BOARĐ
CN801
(See Page 89)
R921 15k
R914 1500
R917 1k
CL920
CL921
CL922
CL923
CL924
CL925
R915 1500
R916 15k
CN902 SP MO NON.Z.F
5 ZOOM SW
4 ZOOM T1
3 ZOOM T2
2 ZOOM W1
1 ZOOM W2
FP-558 (FLEXIBLE)
S4 WIĐE2
S3 WIĐE1
S2 TELLE2
S1 TELLE1
5 ZOOM SW
4 ZOOM T1
3 ZOOM T2
2 ZOOM W1
1 ZOOM W2
ZOOM SWICHI UNIT

Note on the

- Some of th imager (IC9 The correcti of the came also written (upper) of th The correct supplied fo imager to w data label an the camera for input me
- The CCD i CD-96 boar When replac from the old
- Perform all imager has b
- Handle the may be brok Also, preven and strong li

- **SIGNAL PAT**

	CHRO
REC	
PB	


7
8
9
10
11
12
13
14
15
CN901 18P
1 ZOOM SW
2 Ð5V
3 GNÐ
4 VSUB
5 PG
6 -9V
7 H1
8 V2
9 H2
10 V1
11 CAM GNÐ
12 V3
13 VSUB CHK
14 V4
15 VSUB CONT
16 15V
17 CAM GNÐ
18 CCÐ OUT
LNÐ901
CHASSIS GNÐ
TO
CS-37 BOARÐ
CN801
(See Page 89)
CL902
CL904
CL907
CL903
CL906
CL905
CL901
L901
100μH
C901
4.7
20V
:TA
Ð904
MA143
(C-6)
C902
1 50V :AL
CL917
Ð901
MA141WA
(Ð-7)
Q901
MSC4116BC
C905
0.47
F:3216
R908
270k
Ð903
MA141WA
(Ð-6)
R904
68k
Q902
XN1501
C903
3.3
35V
:AL
R901
100k
R902
1M
R907
15k
R909
10k
C910
0.1
F
C911
0.1
F
(Ð-6) (Ð-6)
Q901, 902
V SUB REG
R921
15k
R914
1500
R917
1k
CL920
CL921
CL922
CL923
CL924
CL925
R915
1500
R916
15k
CN902 5P MO NON.Z.F
5 ZOOM SW
4 ZOOM T1
3 ZOOM T2
2 ZOOM W1
1 ZOOM W2
FP-558 (FLEXIBLE)
S4
WIÐE2
S3
WIÐE1
S2
TELLE2
S1
TELLE1
ZOOM SWICHI UNIT

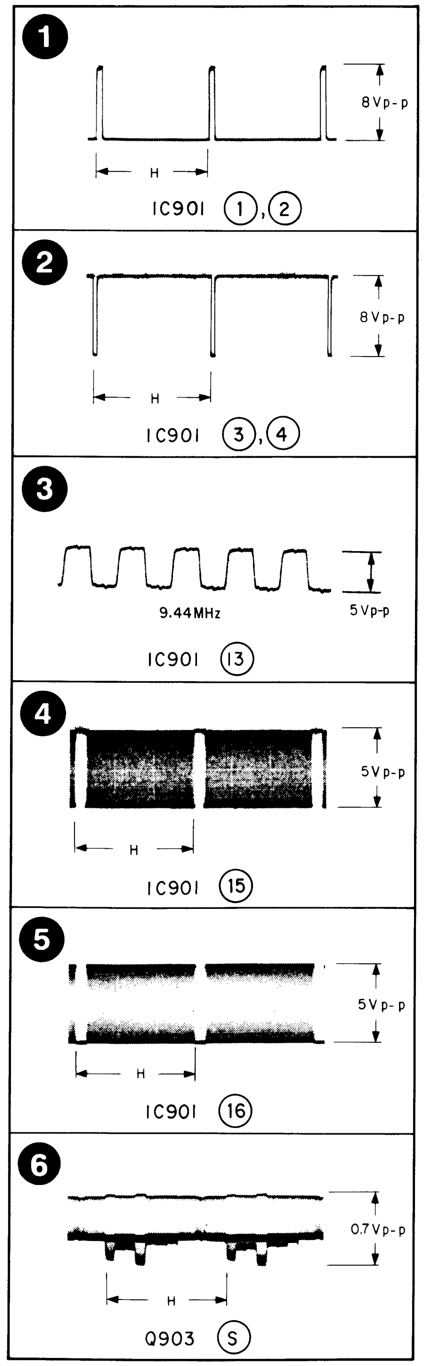
Note on the CCD Imager replacement

- Some of this units require the correction data by the CCD imager (IC901 on CD-96 board), some do not.
  The correction data is input in F page and addresses 1D to 2C of the camera micro processor (IC709 on CS-37 board), and also written on the CCD data label put on the shield case (upper) of the PS-308 board.
  The correction data is not required for the CCD imager supplied for repair. Therefore, when replacing the CCD imager to which the CCD data label is put, remove the CCD data label and input 00 to F page and addresses 1D to 2C of the camera micro processor. Refer to the camera adjustment for input method.
- The CCD imager is not mounted for the already mounted CD-96 board supplied as the repair parts.
  When replacing the CD-96 board, remove the CCD imager from the old board and install on the new board.
- Perform all adjustments of the camera block when the CCD imager has been replaced.
- Handle the CCD imager with attention such as MOS IC as it may be broken by static electricity in the structure.
  Also, prevent the receiving light section from dust attached and strong light.

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	
PB				

CD-96 BOARD



CS-37 (CAMERA, REC/PB AMP, SERVO/SYSTEM CONTROL), FP-488 (INNER FOCUS LENS) PRINTED WIRIN

— Ref. No. CS-37 BOARD: 1000 series —

〈 DIODE 〉

⚠D501	8-719-421-27	DIODE	MA728
D502	8-719-404-46	DIODE	MA110
D503	8-719-110-03	DIODE	RD7. 5ES-B2
D504	8-719-941-86	DIODE	DAN202U
D505	8-719-110-03	DIODE	RD7. 5ES-B2
D506	8-719-110-03	DIODE	RD7. 5ES-B2
D507	8-719-404-46	DIODE	MA110

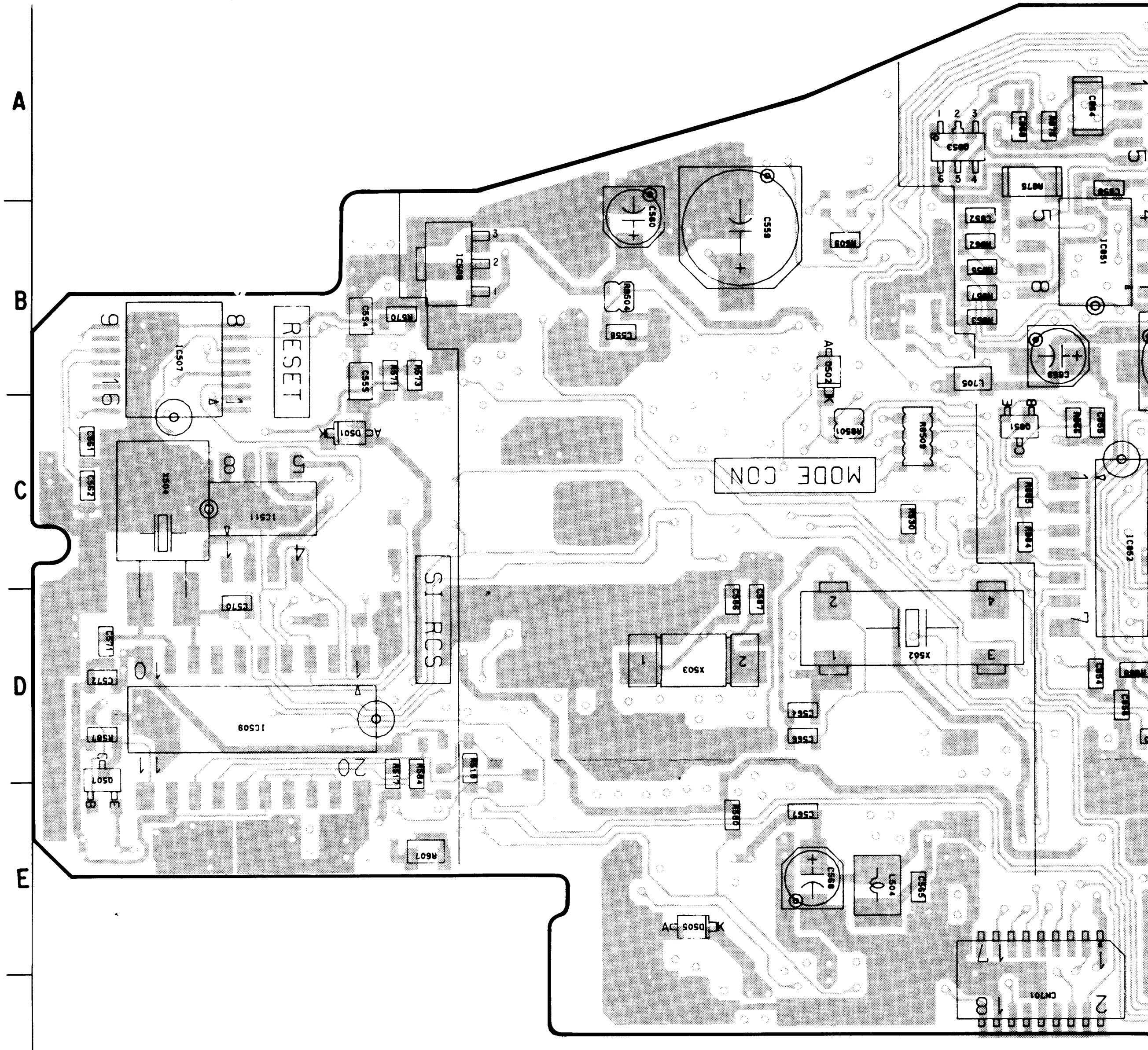
〈 IC 〉

IC001	8-752-033-38	IC	CXA1202R
IC501	8-759-058-96	IC	TB1206F
IC502	8-759-999-02	IC	TL1596CDB
IC503	8-752-838-46	IC	CXP80624-410Q
IC505	8-759-990-55	IC	CXA8006M
IC506	8-759-088-92	IC	uPD75316GF-303-3B9
⚠IC507	8-759-511-22	IC	CXA1448N
IC508	8-759-512-69	IC	S-81350HG-KD
IC509	8-759-145-63	IC	uPD7564G-540
IC510	8-759-039-01	IC	MPC1720M
IC511	8-759-044-78	IC	AK6420F
IC701	8-759-031-58	IC	SC7SU04F
IC702	8-759-635-27	IC	M62352GP
IC703	8-759-069-29	IC	uPD6456GS-618
IC704	8-752-348-92	IC	CXD2101AR
IC705	8-759-063-18	IC	CXD2103AR
IC706	8-752-337-36	IC	CXD2104N
IC707	8-752-347-93	IC	CXD2100AQ
IC709	8-752-837-59	IC	CXP80624-299Q
IC712	8-759-044-78	IC	AK6420F-SGX2060
IC801	8-752-350-16	IC	CXD1257AR
IC802	8-752-056-39	IC	CXA1507BR
IC803	8-752-053-26	IC	CXA1399Q
IC804	8-752-327-48	IC	CXD1250N
IC805	8-752-054-61	IC	CXA1390AR
IC851	8-759-701-24	IC	NJM3414M
IC852	8-759-998-96	IC	LM324D
IC853	8-759-038-81	IC	MPC1724M
IC854	8-759-823-51	IC	LB1830M
IC855	8-759-998-98	IC	LM358D

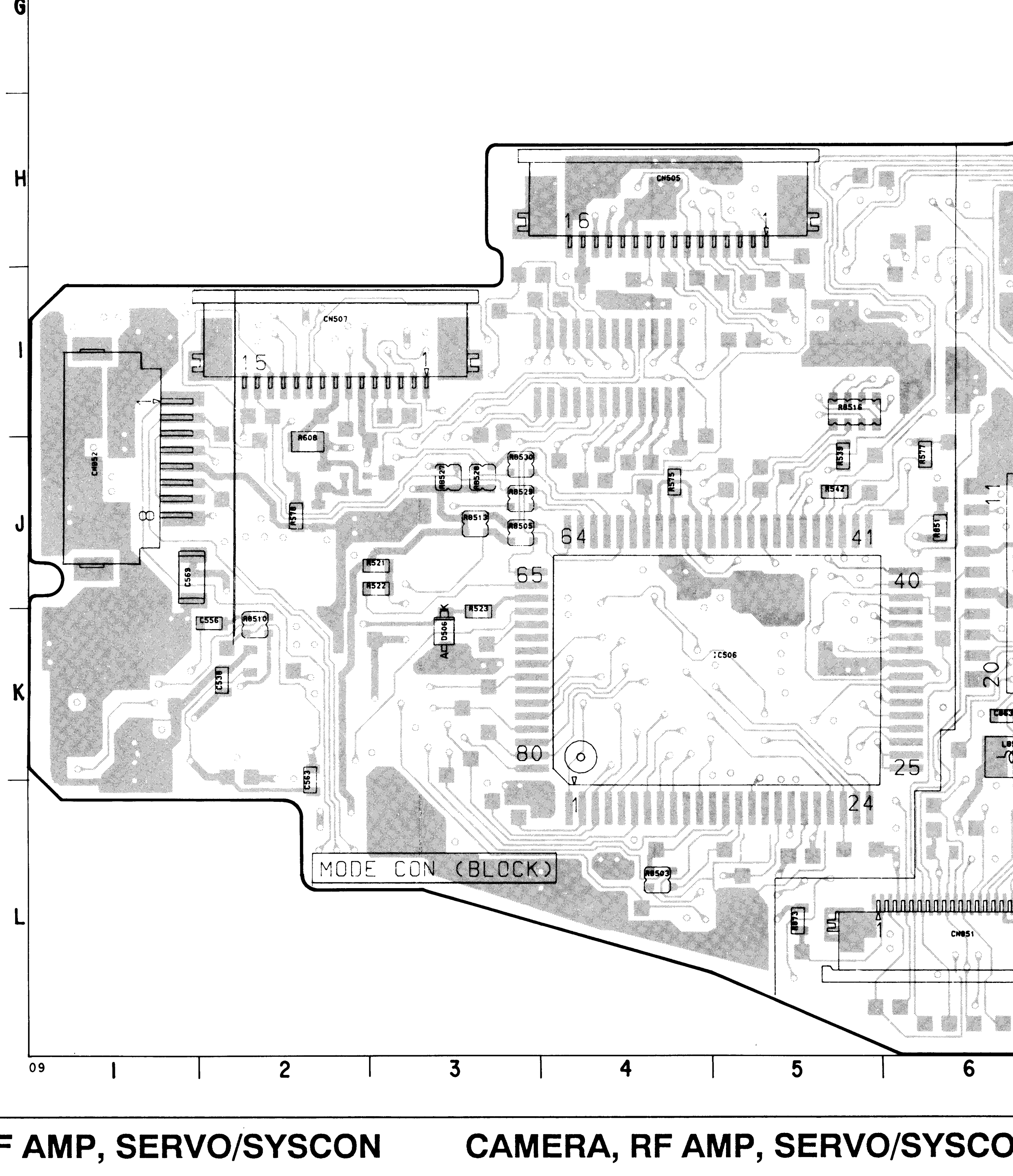
〈 TRANSISTOR 〉

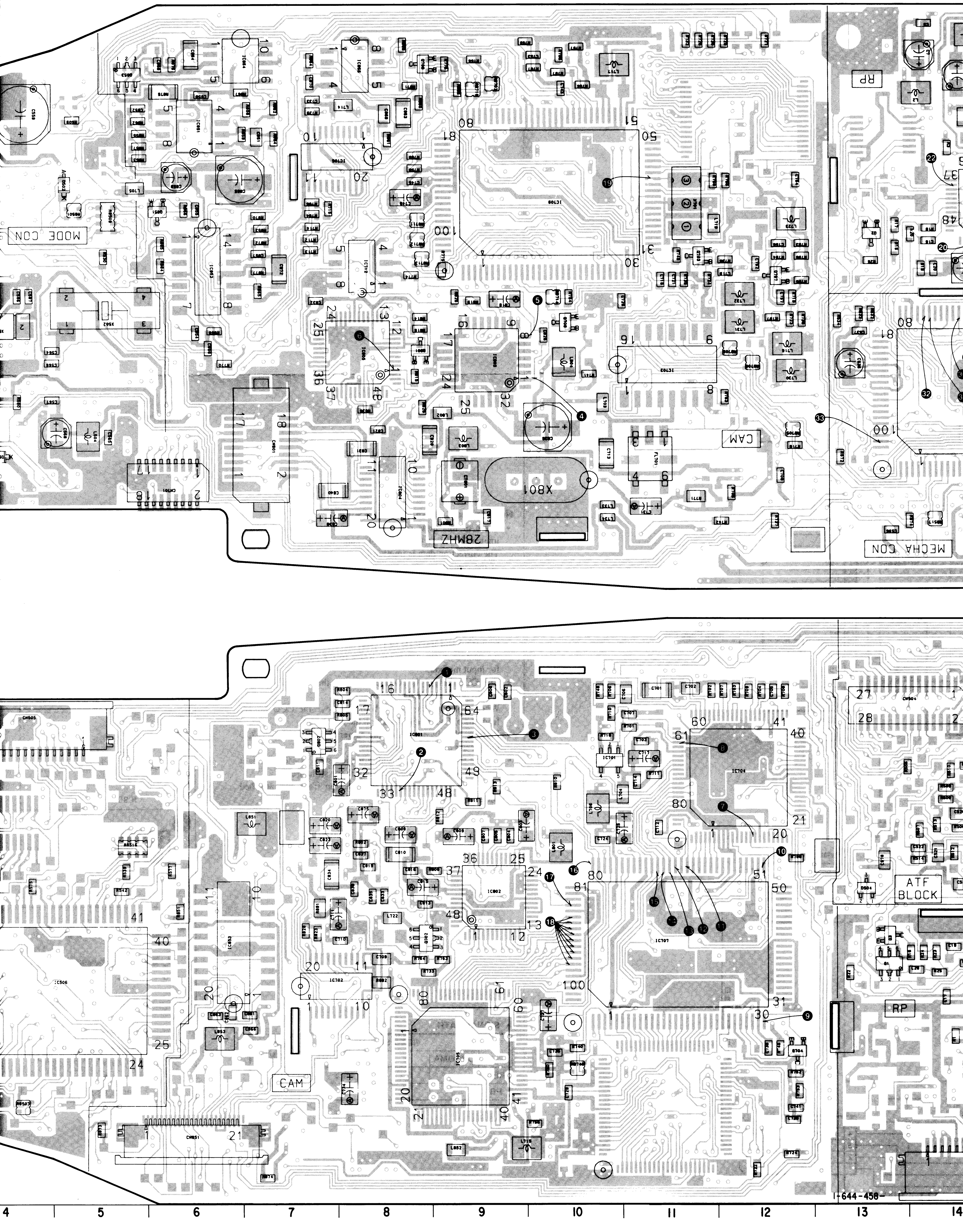
Q001	8-729-420-20	TRANSISTOR	XN4312
Q002	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q003	8-729-905-12	TRANSISTOR	DTA144EU
Q041	8-729-905-23	TRANSISTOR	2SA1576-R
Q043	8-729-216-22	TRANSISTOR	2SA1162-G
Q501	8-729-907-00	TRANSISTOR	DTC114EU
Q502	8-729-402-78	TRANSISTOR	XN6401
Q503	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q507	8-729-905-12	TRANSISTOR	DTA144EU
Q509	8-729-822-84	TRANSISTOR	2SB1202FAST
Q510	8-729-402-81	TRANSISTOR	XN4501
Q511	8-729-402-81	TRANSISTOR	XN4501
Q702	8-729-402-84	TRANSISTOR	XN4601
Q703	8-729-010-60	TRANSISTOR	MSA1586-BC
Q704	8-729-010-60	TRANSISTOR	MSA1586-BC
Q707	8-729-010-75	TRANSISTOR	MSC4116-BC
Q708	8-729-920-XX	TRANSISTOR	DTA114EU
Q709	8-729-905-61	TRANSISTOR	DTC124EU
Q801	8-729-423-52	TRANSISTOR	2SC3931-C
Q802	8-729-403-27	TRANSISTOR	XN4401
Q851	8-729-010-75	TRANSISTOR	MSC4116-BC
Q853	8-729-403-27	TRANSISTOR	XN4401

CS-37 BOARD (COMPONENT SIDE)



CS-37 BOARD (CONDUCTOR SIDE)




MODE CON
IC851
IC852
IC853
IC854
IC855
CN801
CN701
X801
28MHZ
IC801
IC802
IC803
IC804
IC805
IC709
IC710
IC712
IC703
FL701
CAM
RP
MECHA CON
IC506
CN851
IC702
IC705
IC707
IC704
IC701
ATF BLOCK
CN504
1-644-458-
4
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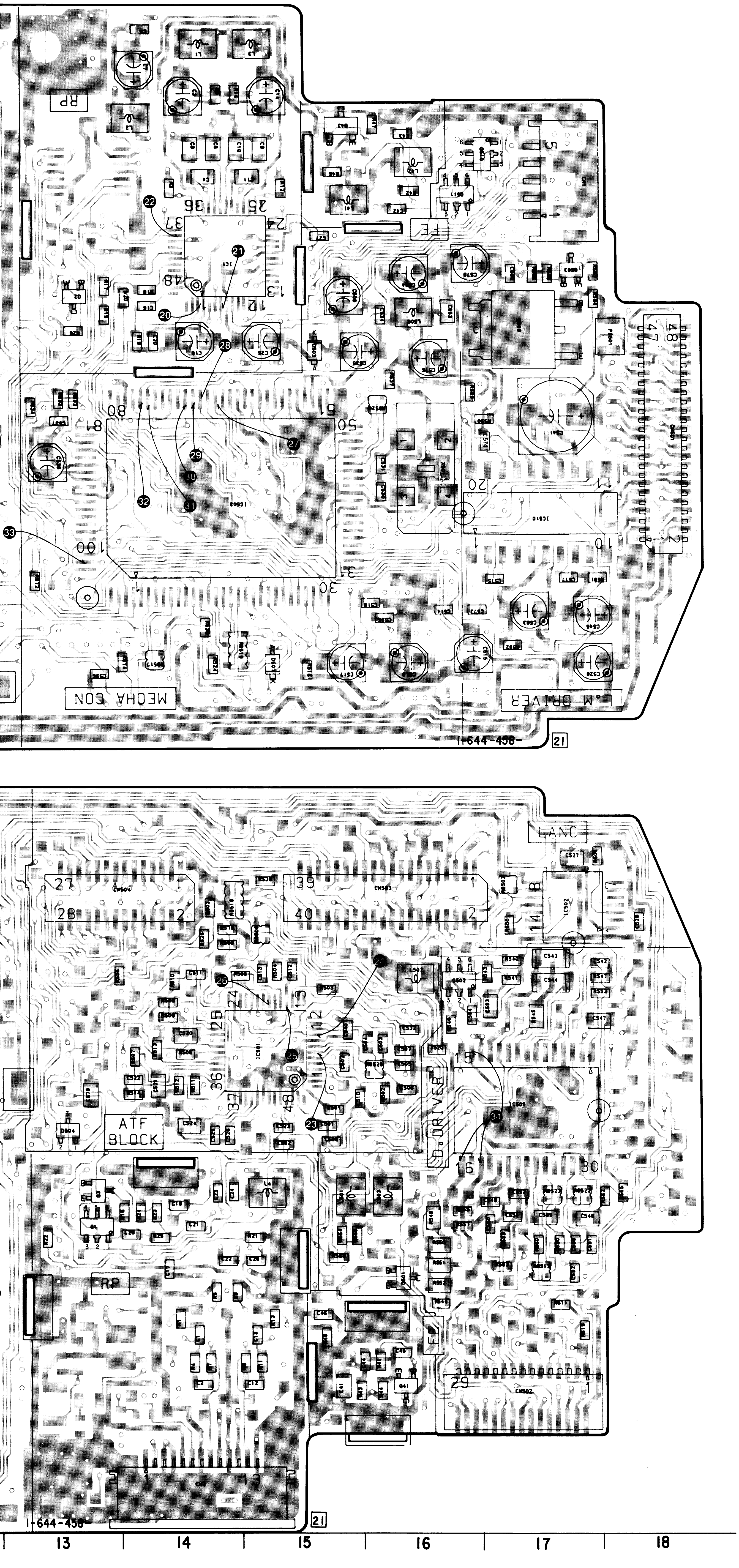
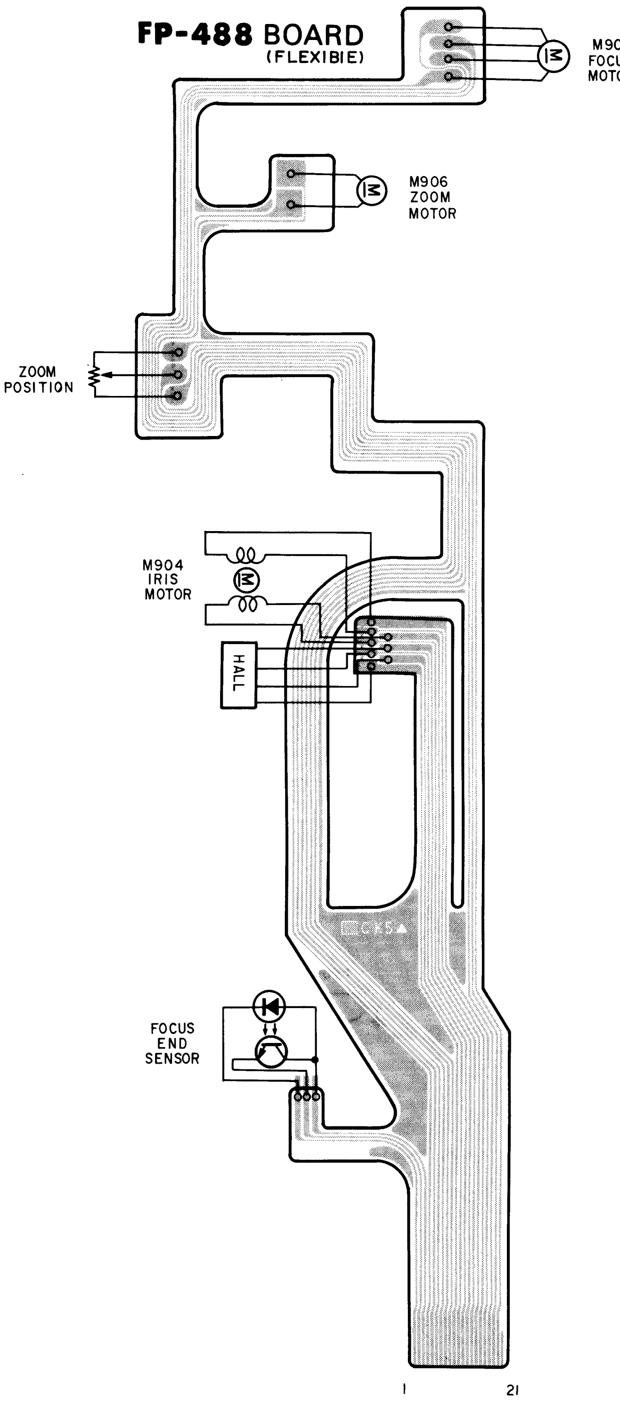

RP
MECHA CON
M DRIVER
IC1
IC503
IC510
CN501
FE
1-644-458-
21
LANC
CN504
CN503
IC502
IC501
ATF BLOCK
D.DRIVER
IC505
RP
FE
CN502
CN1
13
14
15
16
17
18

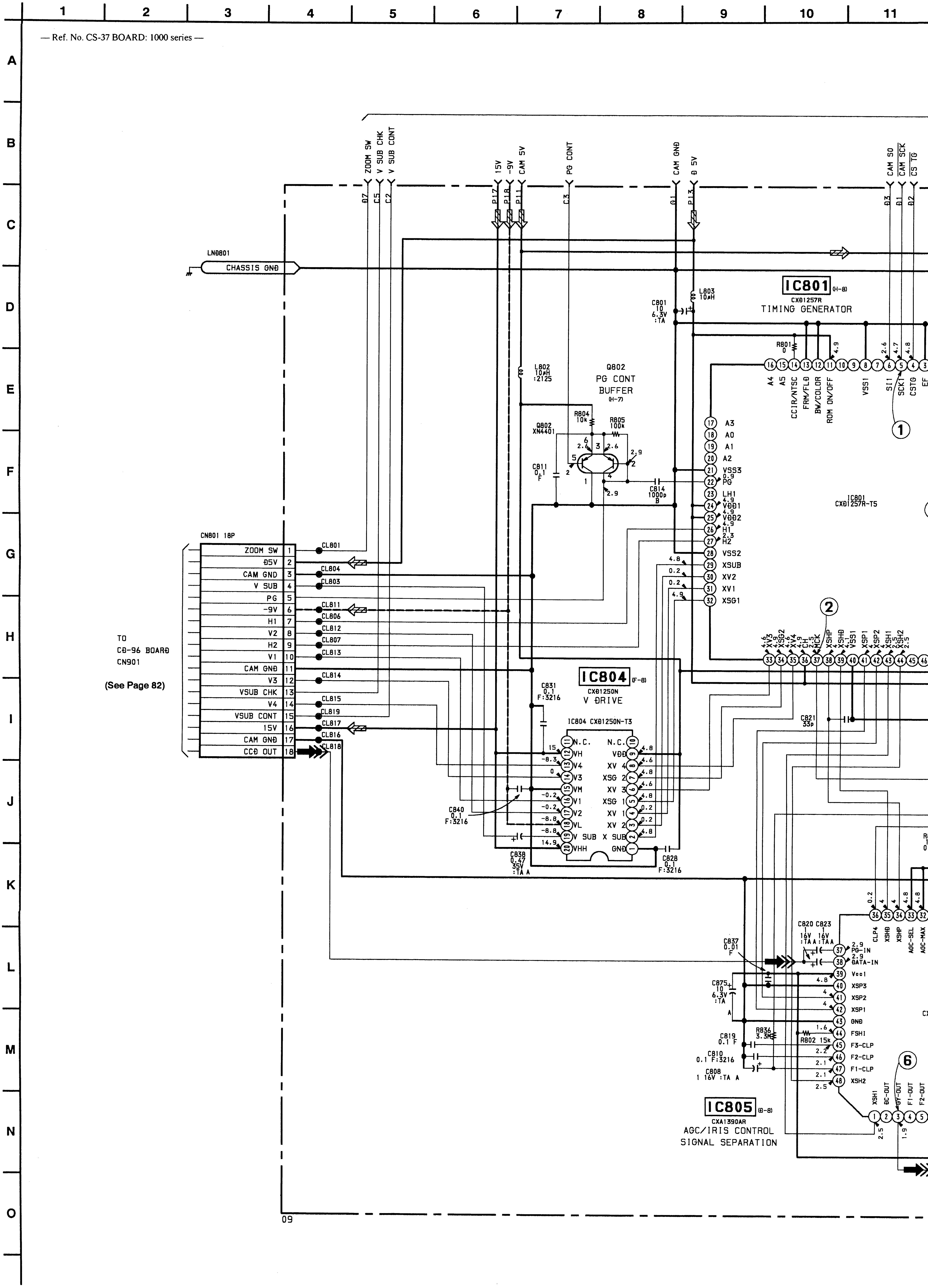
FP-488 BOARD
(FLEXIBIE)


M90
FOCU
MOTO
M906
ZOOM
MOTOR
ZOOM
POSITION
M904
IRIS
MOTOR
HALL
CN5
FOCUS
END
SENSOR
1
21

CS-37 (CAMERA) SCHEMATIC DIAGRAM

- Refer to page 85 for Printed Wiring Board.

— Ref. No. CS-37 BOARD: 1000 series —



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A
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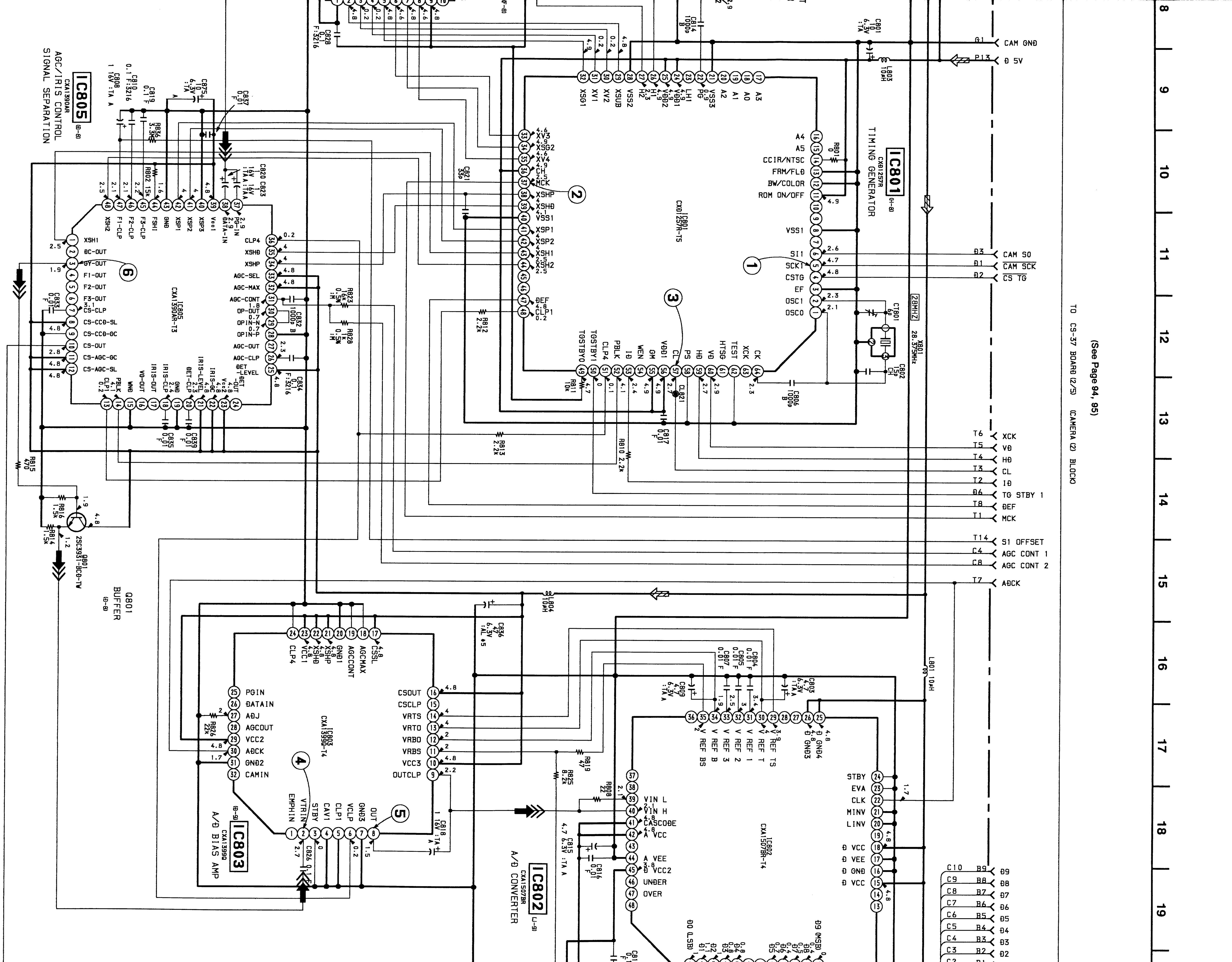
C
D
E
F
G
H
I
J
K
L
M
N
O
CN801 18P
ZOOM SW 1
Ð5V 2
CAM GNÐ 3
V SUB 4
PG 5
-9V 6
H1 7
V2 8
H2 9
V1 10
CAM GNÐ 11
V3 12
VSUB CHK 13
V4 14
VSUB CONT 15
15V 16
CAM GNÐ 17
CCÐ OUT 18
TO
CÐ-96 BOARÐ
CN901
(See Page 82)
LN0801
CHASSIS GNÐ
Ð7 ZOOM SW
C5 V SUB CHK
C2 V SUB CONT
P17 15V
P18 -9V
P11 CAM 5V
C3 PG CONT
G1 CAM GNÐ
P13 Ð 5V
Ð3 CAM SO
Ð1 CAM SCK
Ð2 CS TG
IC801 (H-8)
CX01257R
TIMING GENERATOR
IC801 CX01257R-T5
A4 A5 CCIR/NTSC FRM/FLÐ BW/COLOR ROM ON/OFF VSS1 SI1 SCKT CSTG EF
A3 A0 A1 A2 VSS3 PG LH1 VÐÐ1 VÐÐ2 H1 H2 VSS2 XSUB XV2 XV1 XSG1
XV3 XSG2 XV4 CH MCK XSHP XSHÐ VSS1 XSP1 XSP2 XSH1 XSH2
Q802 PG CONT BUFFER (H-7)
Q802 XN4401
R804 10k
R805 100k
L802 10µH :2125
L803 10µH
C801 10 6.3V :TA
C811 0.1 F
C814 1000p B
IC804 (F-8)
CX01250N
V ÐRIVE
IC804 CX01250N-T3
N.C. VH V4 V3 VM V1 V2 VL V SUB VHH
N.C. VÐÐ XV 4 XSG 2 XV 3 XSG 1 XV 1 XV 2 X SUB GNÐ
C831 0.1 F:3216
C840 0.1 F:3216
C838 0.47 35V :TA A
C828 0.1 F:3216
C821 33p
IC805 (G-8)
CXA1390AR
AGC/IRIS CONTROL
SIGNAL SEPARATION
CLP4 XSHÐ XSHP AGC-SEL AGC-MAX
PG-IN ÐATA-IN Vcc1 XSP3 XSP2 XSP1 GNÐ FSH1 F3-CLP F2-CLP F1-CLP XSH2
XSH1 ÐC-OUT ÐY-OUT F1-OUT F2-OUT
C820 C823 1 1 16V 16V :TA A :TA A
C837 0.01 F
C875 10 6.3V :TA
C819 0.1 F
C810 0.1 F:3216
C808 1 16V :TA A
R836 3.3M
R802 15k
09

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

CS-37 BOARD (1/5) (CAMER


IC805
CXA1390AR
AGC/IRIS CONTROL
SIGNAL SEPARATION
IC805 CXA1390AR-T3
XSH1
BC-OUT
GY-OUT
F1-OUT
F2-OUT
F3-OUT
CS-CLP
CS-CCD-SL
CS-CCD-GC
CS-OUT
CS-AGC-GC
CS-AGC-SL
CLP4
XSHD
XSHP
AGC-SEL
AGC-MAX
AGC-CONT
OP-OUT
OPIN-N
OPIN-P
AGC-OUT
AGC-CLP
DET-LEVEL
DET-OUT
IRIS-GC
IRIS-LEVEL
DET-CLP
GND
IRIS-CLP
IRIS-OUT
VG-OUT
WND
PBLK
CLP1
DATA-IN
PG-IN
Vcc
XSP1
XSP2
XSP3
FSH1
F3-CLP
F2-CLP
F1-CLP
XSH2
IC801
CXD1257R
TIMING GENERATOR
IC801 CXD1257R-T5
XSG1
XV1
XV2
XSUB
VSS2
H2
H1
VDD2
VDD1
LH1
PG
VSS3
A2
A1
A0
A3
A4
A5
CCIR/NTSC
FRM/FLD
BW/COLOR
ROM ON/OFF
VSS1
SI1
SCK1
CSTG
EF
OSC1
OSCO
XV3
XSG2
XV4
CH
MCK
XSHP
XSHD
VSS1
XSP1
XSP2
XSH1
XSH2
DEF
CLP1
TGSTBY0
TGSTBY1
CLP4
PBLK
ID
WEN
GM
VDD1
CL
PS
HD
VD
HTSG
TEST
XCK
CK
28MHZ
X801 28.375MHz
CAM GND
D 5V
CAM SO
CAM SCK
CS TG
XCK
VD
HD
CL
ID
TG STBY 1
DEF
MCK
S1 OFFSET
AGC CONT 1
AGC CONT 2
ADCK
Q801
BUFFER
2SC3931-BCD-TW
IC803
CXA1399Q
A/D BIAS AMP
IC803 CXA1399Q-T4
PGIN
DATAIN
ADJ
AGCOUT
VCC2
ADCK
GND2
CAMIN
CSOUT
CSCLP
VRTS
VRTO
VRBO
VRBS
VCC3
OUTCLP
CLP4
VCC1
XSHD
XSHP
GND1
AGCCONT
AGCMAX
CSSL
EMPHIN
VTRIN
STBY
CAV1
CLP1
VCLP
GND3
OUT
IC802
CXA1507BR
A/D CONVERTER
IC802 CXA1507BR-T4
VIN L
VIN H
CASCODE
A VCC
A VEE
D VCC2
UNDER
OVER
STBY
EVA
CLK
MINV
LINV
D VCC
D VEE
D GND
D VCC
V REF BS
V REF B
V REF 3
V REF 2
V REF 1
V REF T
V REF TS
D GND4
D GND3
D0 (LSB)
D9 (MSB)
D9
D8
D7
D6
D5
D4
D3
D2
L801 10μH
L803 10μH
L804 10μH
8
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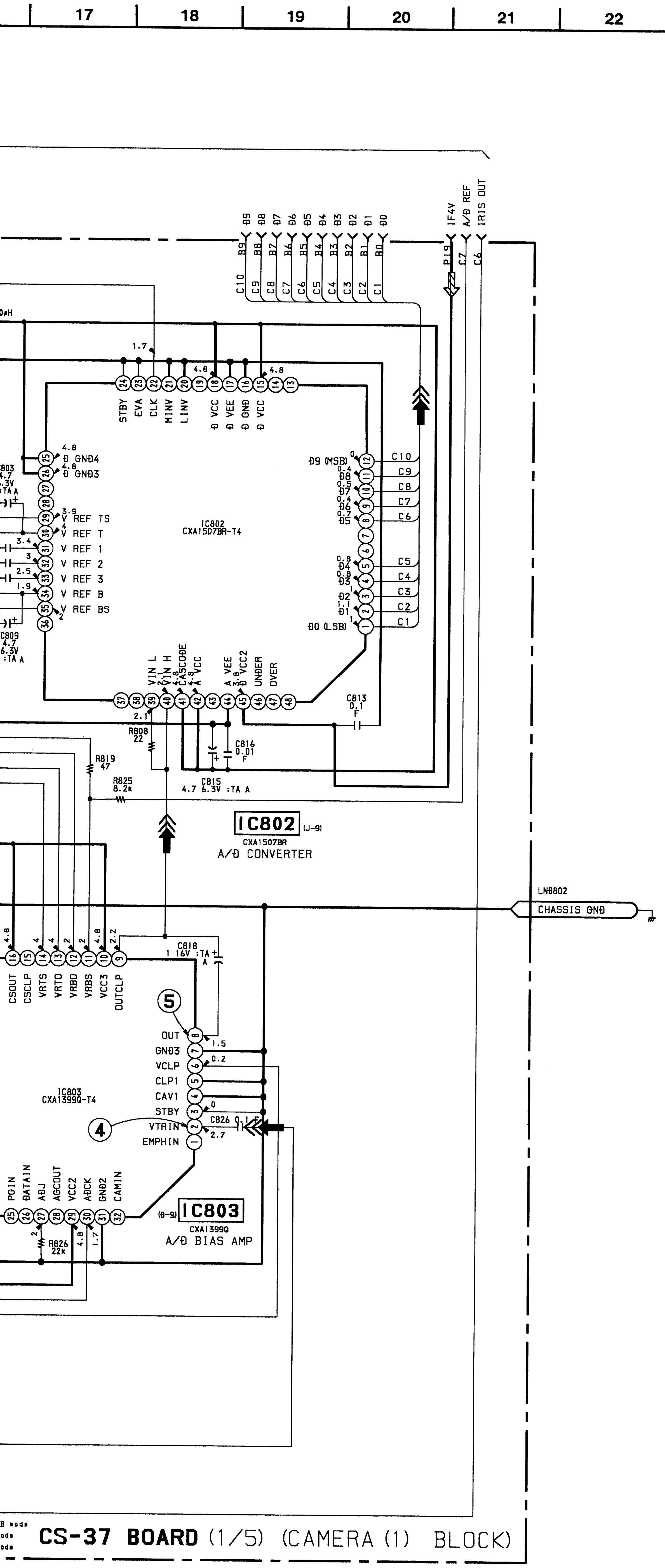
19

(See Page 94, 95)

TO CS-37 BOARD (2/5) (CAMERA (2) BLOCK)

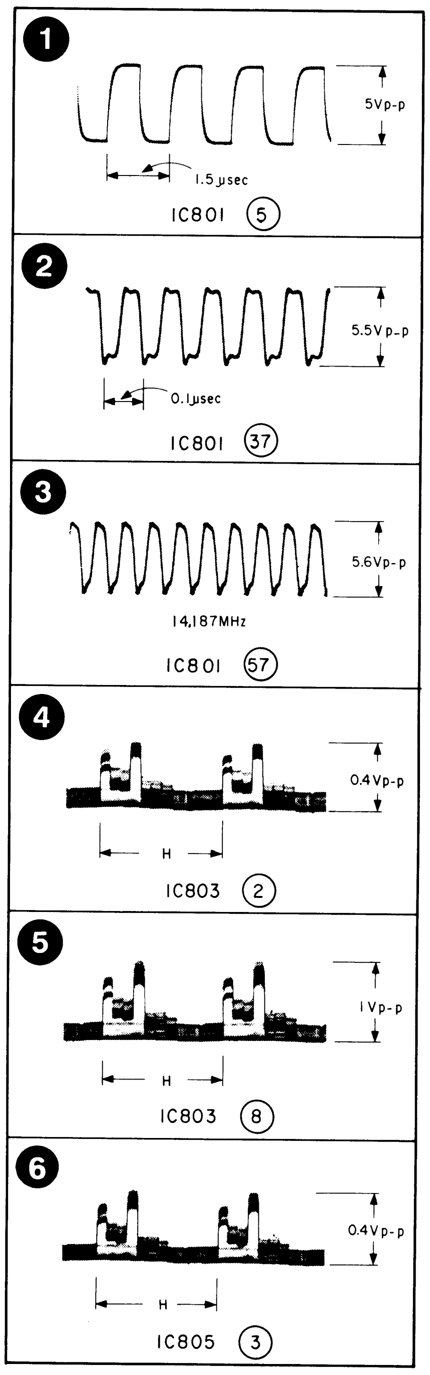

17
18
19
20
21
22
23
24
25
26
27
IC802
CXA1507BR-T4
IC802 (J-9)
CXA1507BR
A/Đ CONVERTER
STBY
EVA
CLK
MINV
LINV
Đ VCC
Đ VEE
Đ GNĐ
Đ VCC
Đ GNĐ4
Đ GNĐ3
V REF TS
V REF T
V REF 1
V REF 2
V REF 3
V REF B
V REF BS
VIN L
VIN H
CASCOĐE
A VCC
A VEE
Đ VCC2
UNĐER
OVER
Đ9 (MSB)
Đ8
Đ7
Đ6
Đ5
Đ4
Đ3
Đ2
Đ1
Đ0 (LSB)
C10
C9
C8
C7
C6
C5
C4
C3
C2
C1
B9
B8
B7
B6
B5
B4
B3
B2
B1
B0
Đ9
Đ8
Đ7
Đ6
Đ5
Đ4
Đ3
Đ2
Đ1
Đ0
P19
C7
C6
IF4V
A/Đ REF
IRIS OUT
C809 4.7 6.3V :TA A
C813 0.1 F
C815 4.7 6.3V :TA A
C816 0.01 F
R808 22
R819 47
R825 8.2k
LNĐ802
CHASSIS GNĐ
CSOUT
CSCLP
VRTS
VRTO
VRBO
VRBS
VCC3
OUTCLP
C818 1 16V :TA A
⑤
OUT
GNĐ3
VCLP
CLP1
CAV1
STBY
VTRIN
EMPHIN
④
C826 0.1 F
IC803
CXA1399Q-T4
PGIN
ĐATAIN
AĐJ
AGCOUT
VCC2
AĐCK
GNĐ2
CAMIN
R826 22k
IC803 (Đ-9)
CXA1399Q
A/Đ BIAS AMP

CS-37 BOARD (1/5) (CAMERA (1) BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡⋙	
PB				

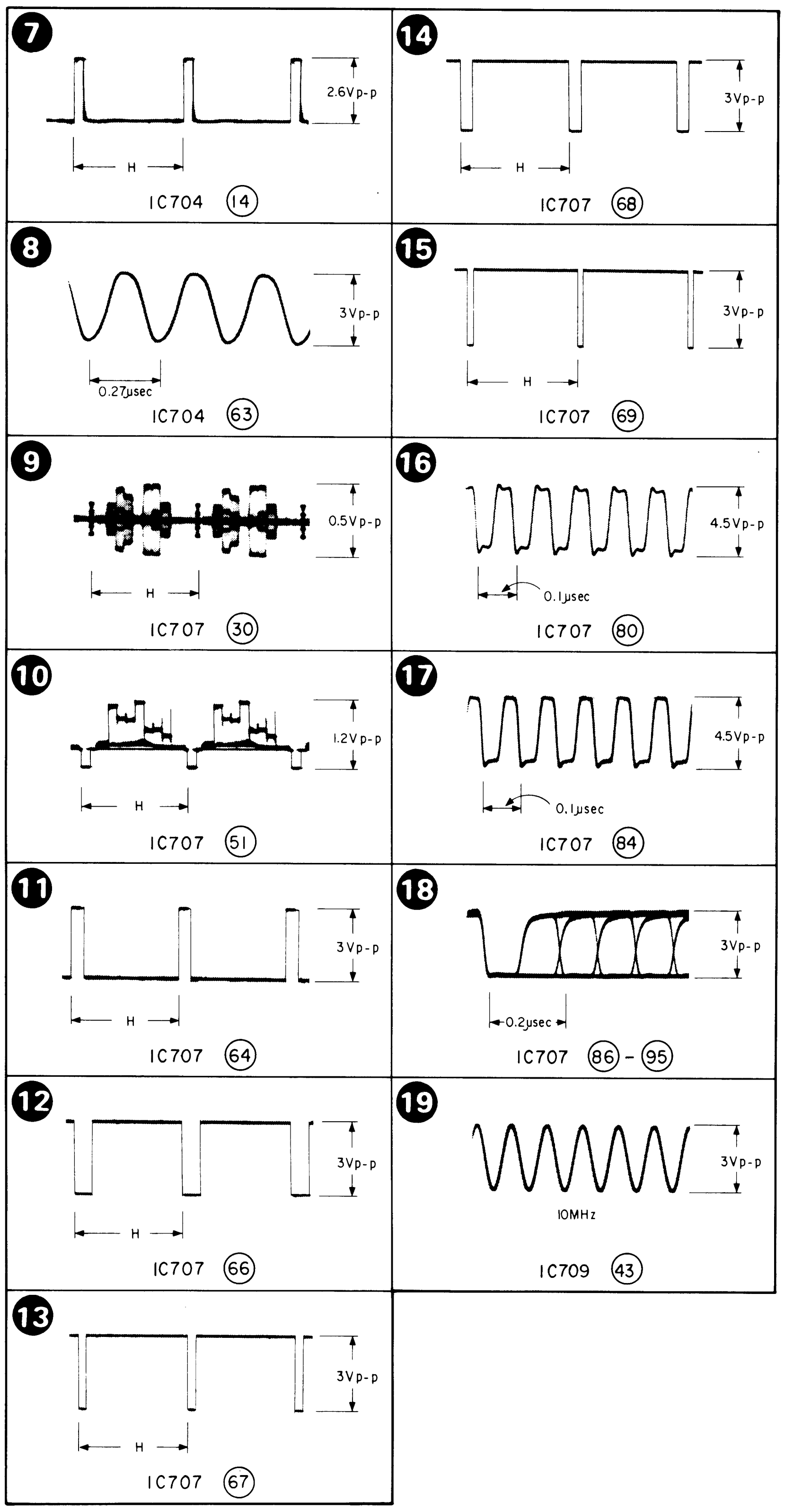
CS-37 BOARD (1/5)



- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	⇒	⇛	
PB				

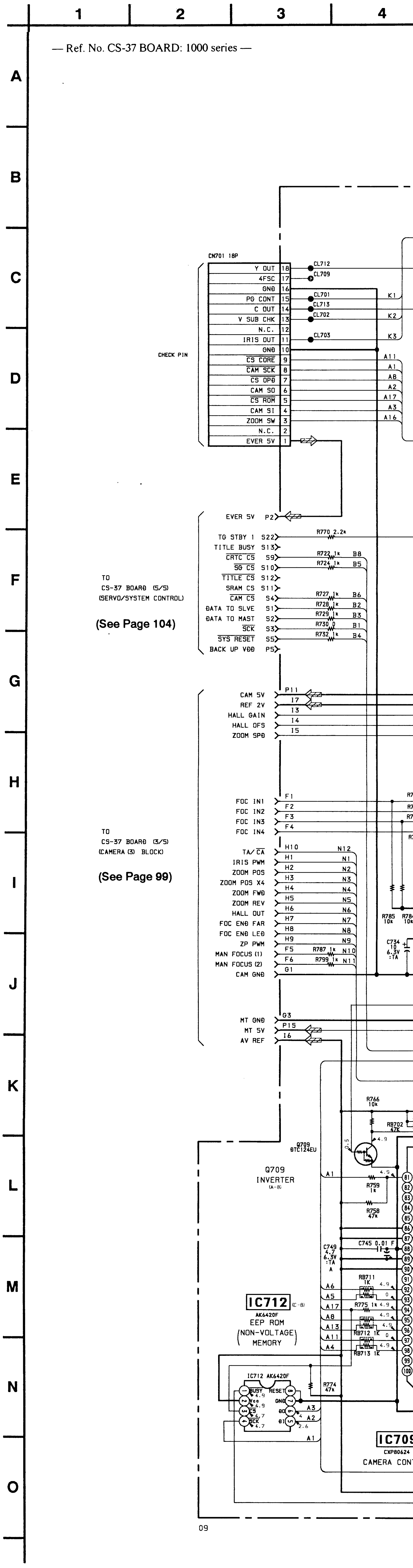
CS-37 BOARD (2/5)



CS-37 (CAMERA) SCHEMATIC DIAGRAM

• Refer to p

— Ref. No. CS-37 BOARD: 1000 series —


1
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A
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C
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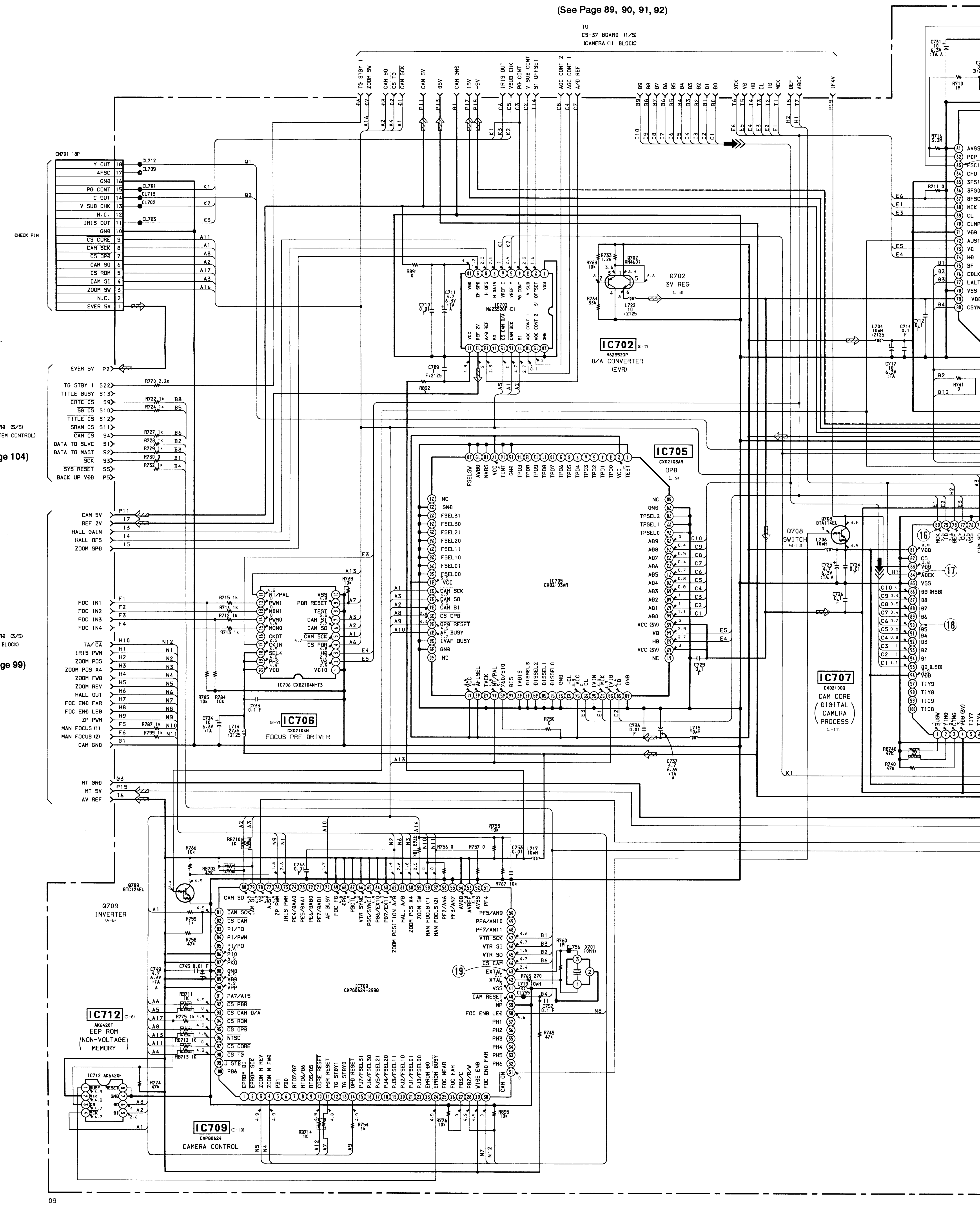
G
H
I
J
K
L
M
N
O
CN701 18P
Y OUT 18
4FSC 17
GND 16
PG CONT 15
C OUT 14
V SUB CHK 13
N.C. 12
IRIS OUT 11
GND 10
CS CORE 9
CAM SCK 8
CS OPD 7
CAM SO 6
CS ROM 5
CAM SI 4
ZOOM SW 3
N.C. 2
EVER 5V 1
CHECK PIN
CL712
CL709
CL701
CL713
CL702
CL703
K1
K2
K3
A11
A1
A8
A2
A17
A3
A16
EVER 5V P2
TG STBY 1 S22
TITLE BUSY S13
CRTC CS S9
SG CS S10
TITLE CS S12
SRAM CS S11
CAM CS S4
DATA TO SLVE S1
DATA TO MAST S2
SCK S3
SYS RESET S5
BACK UP VDD P5
R770 2.2k
R722 1k
R724 1k
B8
B5
R727 1k
R728 1k
R729 1k
R730 0
R732 1k
B6
B2
B3
B1
B4
TO
CS-37 BOARD (5/5)
(SERVO/SYSTEM CONTROL)
(See Page 104)
CAM 5V P11
REF 2V 17
HALL GAIN 13
HALL OFS 14
ZOOM SPD 15
FOC IN1 F1
FOC IN2 F2
FOC IN3 F3
FOC IN4 F4
TA/CA H10
IRIS PWM H1
ZOOM POS H2
ZOOM POS X4 H3
ZOOM FWD H4
ZOOM REV H5
HALL OUT H6
FOC END FAR H7
FOC END LED H8
ZP PWM H9
MAN FOCUS (1) F5
MAN FOCUS (2) F6
CAM GND G1
N12
N1
N2
N3
N4
N5
N6
N7
N8
N9
N10
N11
R787 1k
R799 1k
R785 10k
R784 10k
C734 10 6.3V :TA
TO
CS-37 BOARD (3/5)
(CAMERA (3) BLOCK)
(See Page 99)
MT GND G3
MT 5V P15
AV REF I6
R766 10k
RB702 47K
Q709 DTC124EU
0.5
4.9
Q709
INVERTER
(A-8)
A1
R759 1k
R758 47k
C749 4.7 6.3V :TA A
C745 0.01 F
RB711 1K
R775 1k
RB712 1K
RB713 1K
A6
A5
A17
A8
A13
A11
A4
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
IC712 (C-8)
AK6420F
EEP ROM
(NON-VOLTAGE MEMORY)
IC712 AK6420F
BUSY
Vcc
CS
SCK
RESET
GND
DO
DI
4.9
4.7
2.6
R774 47k
A3
A2
A1
IC709
CXP80624
CAMERA CON
09

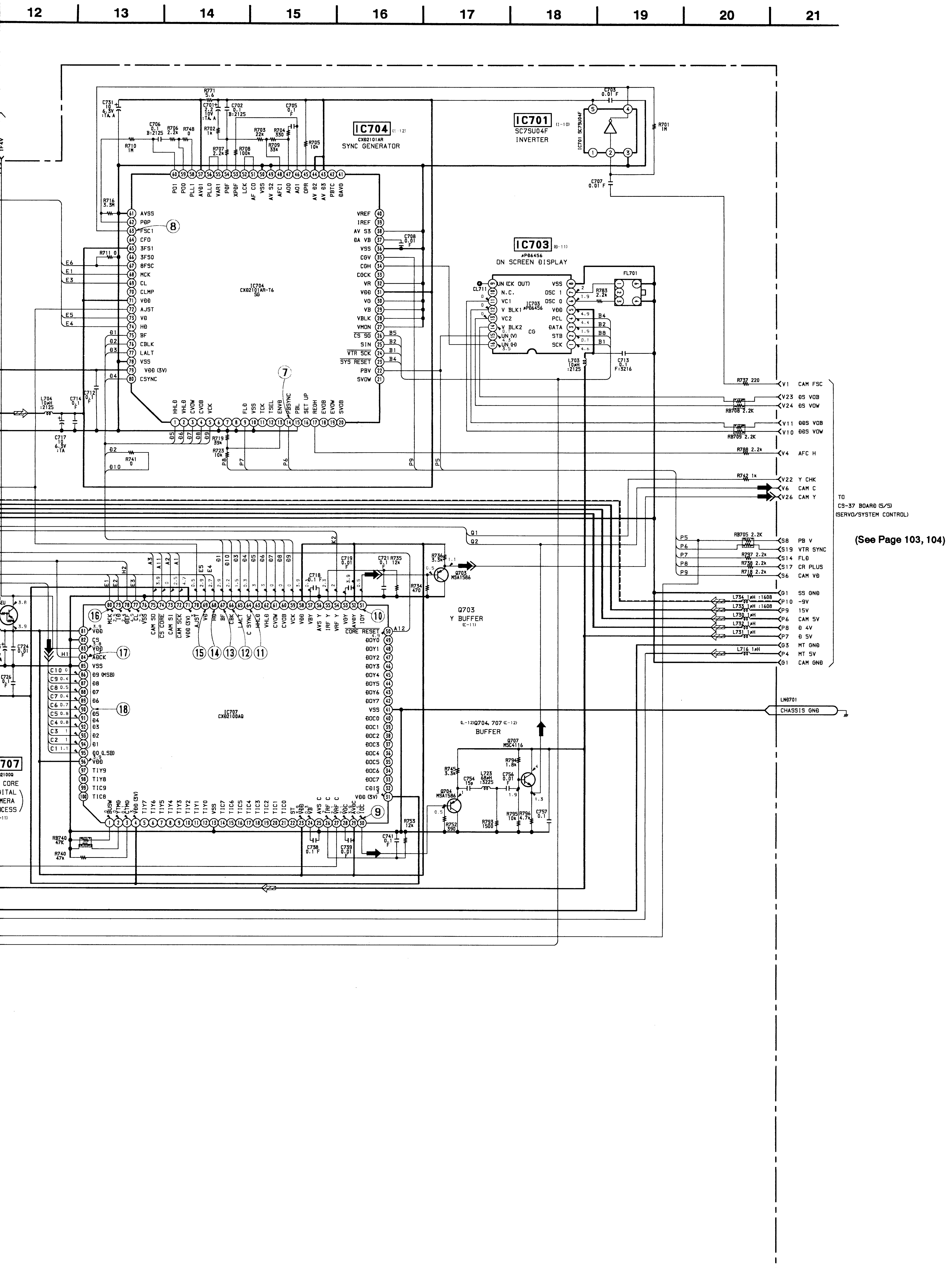
) SCHEMATIC DIAGRAM

• Refer to page 85 for Printed Wiring Board.

2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13

BOARD: 1000 series —

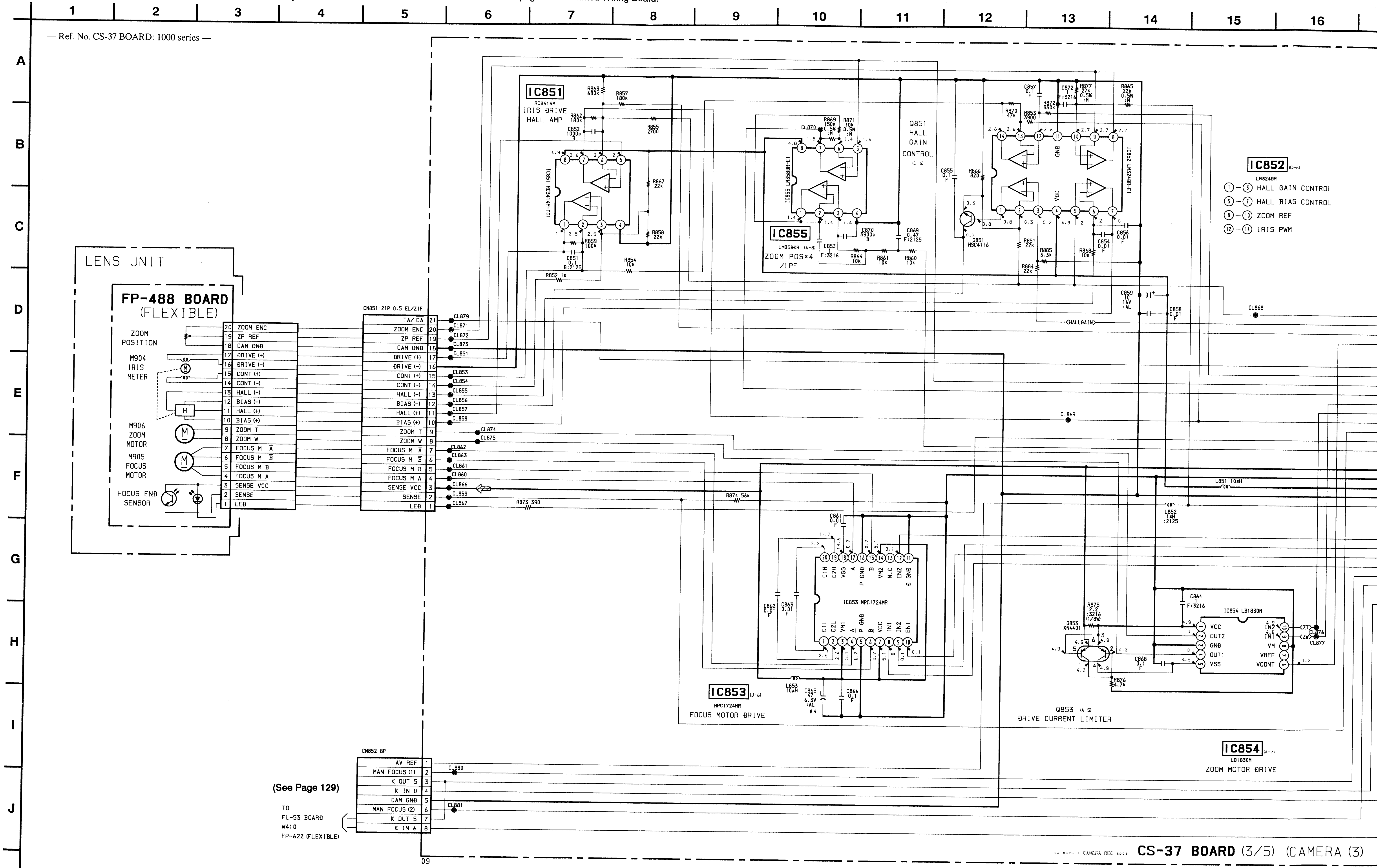

(See Page 89, 90, 91, 92)
TO CS-37 BOARD (1/5) (CAMERA (1) BLOCK)
CN701 18P
CHECK PIN
ge 104)
ge 99)
IC702
M62352GP
D/A CONVERTER (EVR)
Q702
3V REG
IC705
CXD2103AR
OPD
IC706
CXD2104N
FOCUS PRE DRIVER
IC707
CXD2100Q
CAM CORE (DIGITAL CAMERA PROCESS)
Q708
SWITCH
Q709
INVERTER
IC709
CXP80624
CAMERA CONTROL
IC712
AK6420F
EEP ROM (NON-VOLTAGE) MEMORY
X701 10MHz
09


12
13
14
15
16
17
18
19
20
21
IC704
CX02101AR
SYNC GENERATOR
IC701
SC7SU04F
INVERTER
IC703
μPD6456
ON SCREEN DISPLAY
FL701
IC707
CX02100AQ
Q703
MSA1586
Y BUFFER
Q704, 707
BUFFER
Q707
MSC4116
Q704
MSA1586
V1 CAM FSC
V23 ΘS VDB
V24 ΘS VDW
V11 ΘΘS VDB
V10 ΘΘS VDW
V4 AFC H
V22 Y CHK
V6 CAM C
V26 CAM Y
S8 PB V
S19 VTR SYNC
S14 FLΘ
S17 CR PLUS
S6 CAM VΘ
G1 SS GNΘ
P10 -9V
P9 15V
P6 CAM 5V
P8 Θ 4V
P7 Θ 5V
G3 MT GNΘ
P4 MT 5V
G1 CAM GNΘ
LN0701
CHASSIS GNΘ
TO
CS-37 BOARΘ (5/5)
(SERVO/SYSTEM CONTROL)
(See Page 103, 104)

CS-31 **BOARD** (2/5) (CAMERA (2) BLOCK)

• Refer to page 85 for Printed Wiring Board.

— Ref. No. CS-37 BOARD: 1000 series —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16
A
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C
D
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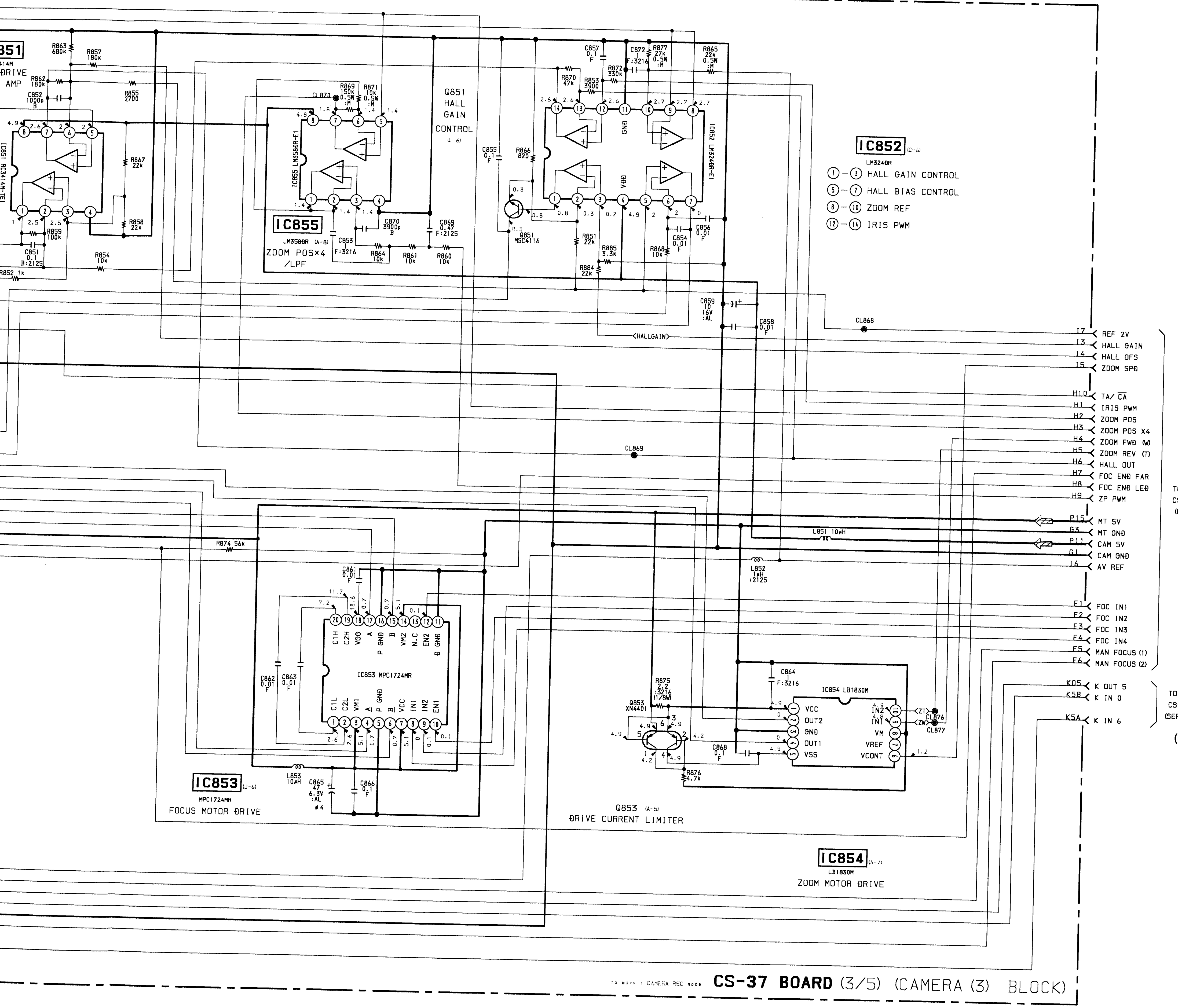
G
H
I
J
LENS UNIT
FP-488 BOARD
(FLEXIBLE)
ZOOM POSITION
M904 IRIS METER
M906 ZOOM MOTOR
M905 FOCUS MOTOR
FOCUS END SENSOR
20 ZOOM ENC
19 ZP REF
18 CAM GND
17 DRIVE (+)
16 DRIVE (-)
15 CONT (+)
14 CONT (-)
13 HALL (-)
12 BIAS (-)
11 HALL (+)
10 BIAS (+)
9 ZOOM T
8 ZOOM W
7 FOCUS M A
6 FOCUS M B
5 FOCUS M B
4 FOCUS M A
3 SENSE VCC
2 SENSE
1 LED
CN851 21P 0.5 EL/ZIF
TA/CA 21
IC851
RC3414M
IRIS DRIVE HALL AMP
IC855
LM358DR
ZOOM POS×4 /LPF
Q851
HALL GAIN CONTROL
IC852
LM324DR
①-③ HALL GAIN CONTROL
⑤-⑦ HALL BIAS CONTROL
⑧-⑩ ZOOM REF
⑫-⑭ IRIS PWM
Q851 MSC4116
<HALLGAIN>
CL868
CL869
L851 10μH
L852 1μH
IC853
MPC1724MR
FOCUS MOTOR DRIVE
IC853 MPC1724MR
Q853 XN4401
Q853 DRIVE CURRENT LIMITER
IC854 LB1830M
IC854
LB1830M
ZOOM MOTOR DRIVE
VCC
OUT2
GND
OUT1
VSS
IN2
IN1
VM
VREF
VCONT
<ZT>
<ZW>
CN852 8P
1 AV REF
2 MAN FOCUS (1)
3 K OUT 5
4 K IN 0
5 CAM GND
6 MAN FOCUS (2)
7 K OUT 5
8 K IN 6
CL880
CL881
09

(See Page 129)

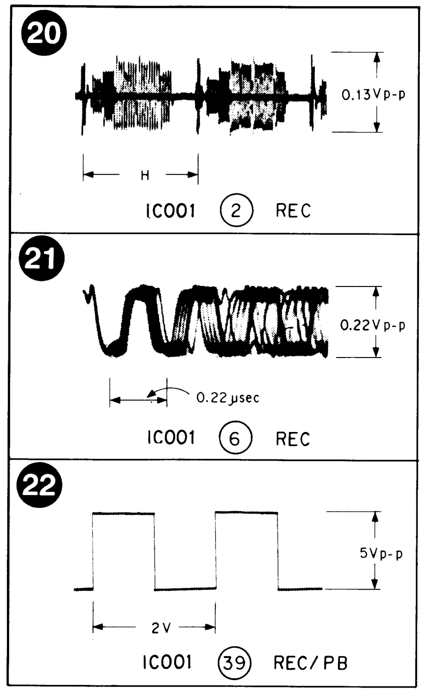
TO
FL-53 BOARD
W410
FP-622 (FLEXIBLE)

CS-37 BOARD (3/5) (CAMERA (3)


851
DRIVE
AMP
IC851 RC3414M-TE1
R863 680k
R857 180k
R862 180k
C852 1000p B
R855 2700
R867 22k
R858 22k
R859 100k
C851 0.1 B:2125
R854 10k
R852 1k
IC855 LM358OR-E1
IC855
LM358OR (A-8)
ZOOM POS×4 /LPF
CL870
R869 150k 0.5W :M
R871 10k 0.5W :M
C853 1 F:3216
R864 10k
C870 3900p B
R861 10k
R860 10k
C869 0.47 F:2125
Q851 HALL GAIN CONTROL (L-6)
C855 0.1 F
R866 820
Q851 MSC4116
C857 0.1 F
C872 1 F:3216
R877 27k 0.5W :M
R870 47k
R853 3900
R872 330k
R865 22k 0.5W :M
IC852 LM324OR-E1
GND
VDD
R851 22k
R885 3.3k
R884 22k
R868 10k
C854 0.01 F
C856 0.01 F
IC852 (C-6)
LM324OR
①-③ HALL GAIN CONTROL
⑤-⑦ HALL BIAS CONTROL
⑧-⑩ ZOOM REF
⑫-⑭ IRIS PWM
C859 10 16V :AL
C858 0.01 F
<HALLGAIN>
CL868
CL869
I7 REF 2V
I3 HALL GAIN
I4 HALL OFS
I5 ZOOM SPD
H10 TA/ CA
H1 IRIS PWM
H2 ZOOM POS
H3 ZOOM POS X4
H4 ZOOM FWD (W)
H5 ZOOM REV (T)
H6 HALL OUT
H7 FOC END FAR
H8 FOC END LED
H9 ZP PWM
P15 MT 5V
G3 MT GND
P11 CAM 5V
G1 CAM GND
I6 AV REF
F1 FOC IN1
F2 FOC IN2
F3 FOC IN3
F4 FOC IN4
F5 MAN FOCUS (1)
F6 MAN FOCUS (2)
TO CS-37 BOARD (2/5) (CAMERA (2) BLOCK)
(See Page 94)
K05 K OUT 5
K5B K IN 0
K5A K IN 6
TO CS-37 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOCK)
(See Page 103)
L851 10μH
L852 1μH :2125
R874 56k
C861 0.01 F
C1H C2H VGG A P GND B VM2 N.C EN2 D GND
IC853 MPC1724MR
C1L C2L VM1 A P GND B VCC IN1 IN2 EN1
C862 0.01 F
C863 0.01 F
L853 10μH
C865 47 6.3V :AL
C866 0.1 F
IC853 (J-6)
MPC1724MR
FOCUS MOTOR DRIVE
R875 2.2 :3216 (1/8W)
Q853 XN4401
R876 4.7k
C868 0.1 F
Q853 (A-5)
DRIVE CURRENT LIMITER
C864 1 F:3216
IC854 LB1830M
VCC OUT2 GND OUT1 VSS
IN2 IN1 VM VREF VCONT
(ZT) (ZW)
CL876
CL877
IC854 (A-7)
LB1830M
ZOOM MOTOR DRIVE
: CAMERA REC mode

CS-37 BOARD (3/5) (CAMERA (3) BLOCK)

CS-37 BOARD (4/5)



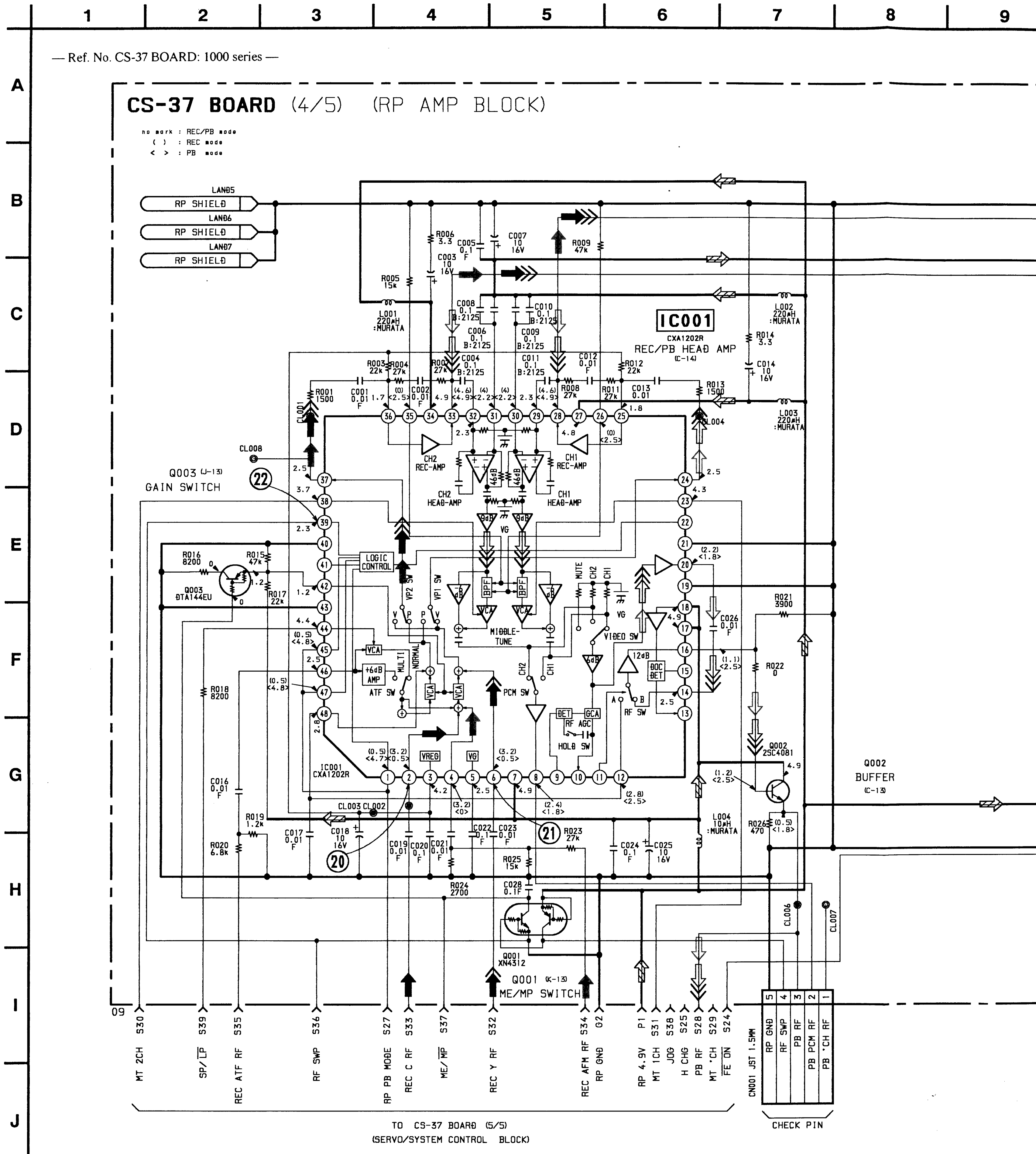
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡≫	➡≫≫	➡
PB	⇨	⇨≫	⇨≫≫	⇨

CS-37 (REC/PB AMP) SCHEMATIC DIAGRAM

- Refer to page 85 for Printed Wiring Board.

— Ref. No. CS-37 BOARD: 1000 series —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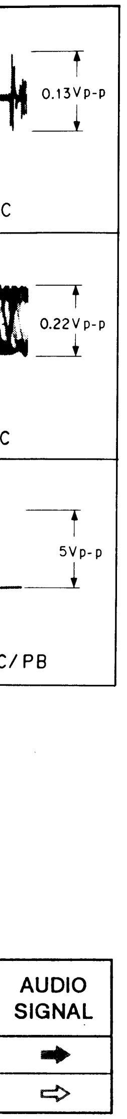
I
J
CS-37 BOARD (4/5) (RP AMP BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
IC001
CXA1202R
REC/PB HEAD AMP
RP SHIELD
Q003 GAIN SWITCH
Q003 DTA144EU
Q001 XN4312
Q001 ME/MP SWITCH
Q002 2SC4081
Q002 BUFFER
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
LOGIC CONTROL
MIDDLE-TUNE
VIDEO SW
PCM SW
RF SW
RF AGC
HOLD SW
ATF SW
MT 2CH
SP/LP
REC ATF RF
RF SWP
RP PB MODE
REC C RF
ME/MP
REC Y RF
REC AFM RF
RP GND
RP 4.9V
MT 1CH
JOG
H CHG
PB RF
MT ¯CH
FE ON
CN001 JST 1.5MM
RP GND
RF SWP
PB RF
PB PCM RF
PB ¯CH RF
CHECK PIN
TO CS-37 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)

(See Page 105)

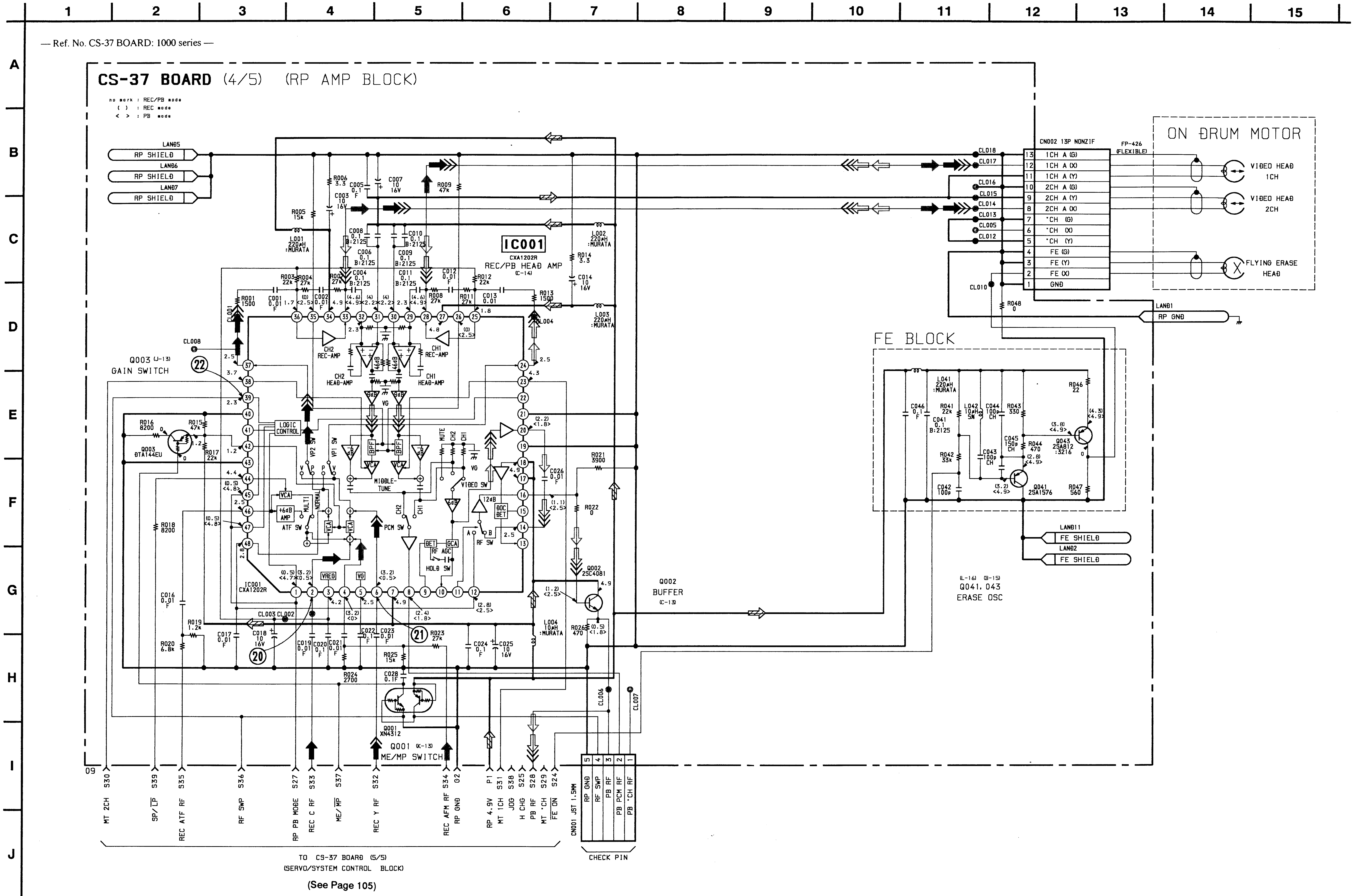
CS-37 (REC/PB AMP) SCHEMATIC DIAGRAM

• Refer to page 85 for Printed Wiring Board.

— Ref. No. CS-37 BOARD: 1000 series —



0.13Vp-p
0.22Vp-p
5Vp-p
C/PB
AUDIO SIGNAL



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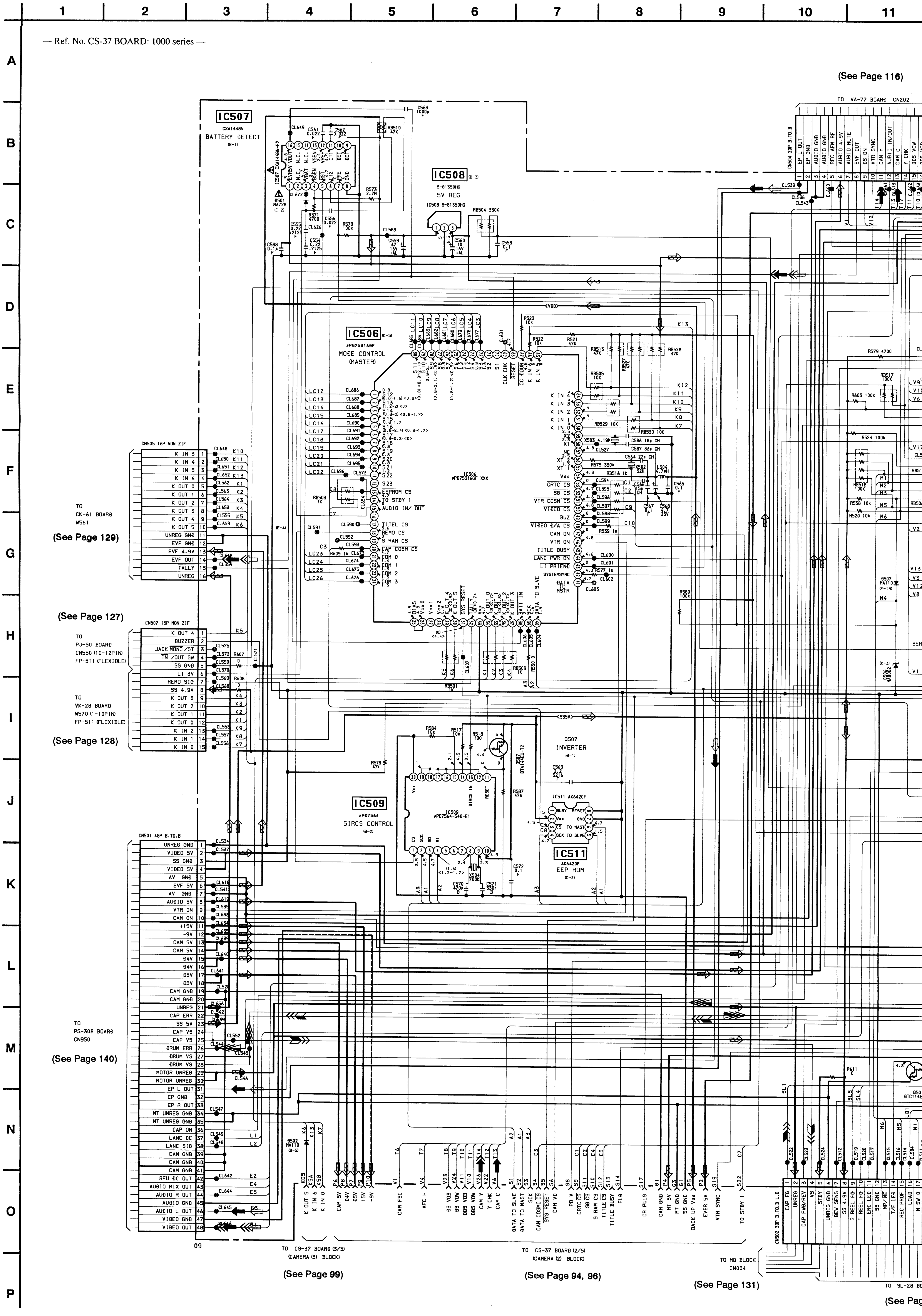
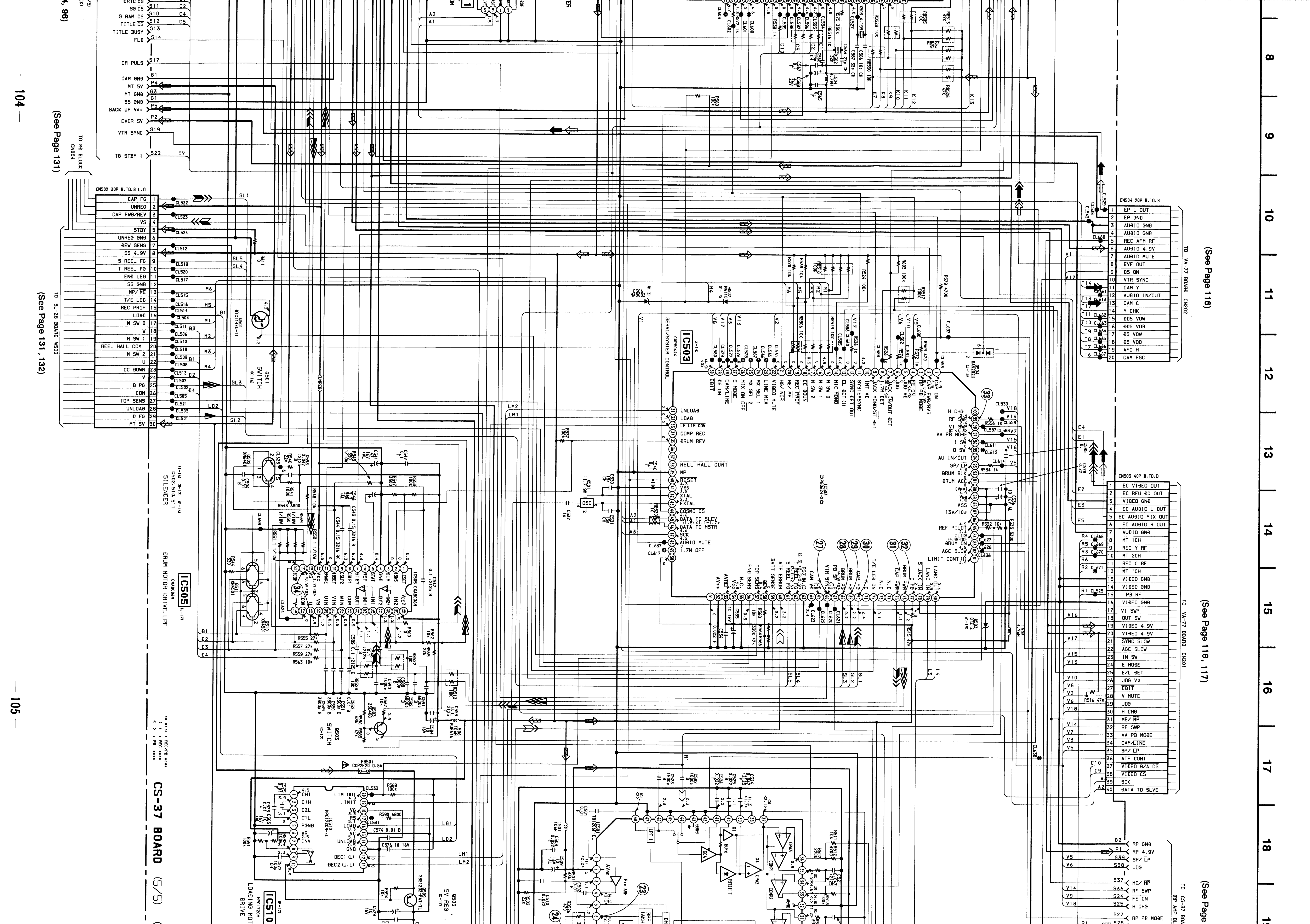
A
B
C
D
E
F
G
H
I
J
CS-37 BOARD (4/5) (RP AMP BLOCK)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode
LAN05
RP SHIELD
LAN06
RP SHIELD
LAN07
RP SHIELD
IC001
CXA1202R
REC/PB HEAD AMP
(C-14)
Q003 (J-13)
GAIN SWITCH
Q003
DTA144EU
CL008
L001
220μH
:MURATA
L002
220μH
:MURATA
L003
220μH
:MURATA
L004
10μH
:MURATA
CH2
REC-AMP
CH1
REC-AMP
CH2
HEAD-AMP
CH1
HEAD-AMP
VG
LOGIC CONTROL
VCA
+6dB AMP
ATF SW
MULTI
NORMAL
MIDDLE-TUNE
PCM SW
MUTE
VIDEO SW
RF SW
RF AGC
HOLD SW
BET
GCA
12dB
VREG
IC001
CXA1202R
Q002
2SC4081
Q002
BUFFER
(C-13)
Q001
XN4312
Q001 (K-13)
ME/MP SWITCH
CN002 13P NONZIF
FP-426
(FLEXIBLE)
CL018
CL017
CL016
CL015
CL014
CL013
CL005
CL012
CL010
CL006
CL007
CL003
CL002
13 1CH A (G)
12 1CH A (X)
11 1CH A (Y)
10 2CH A (G)
9 2CH A (Y)
8 2CH A (X)
7 'CH (G)
6 'CH (X)
5 'CH (Y)
4 FE (G)
3 FE (Y)
2 FE (X)
1 GND
ON DRUM MOTOR
VIDEO HEAD
1CH
VIDEO HEAD
2CH
FLYING ERASE
HEAD
LAN01
RP GND
FE BLOCK
L041
220μH
:MURATA
Q043
2SA812
:3216
Q041
2SA1576
(L-16) (B-15)
Q041, 043
ERASE OSC
LAN011
FE SHIELD
LAN02
FE SHIELD
09
S30 MT 2CH
S39 SP/LP
S35 REC ATF RF
S36 RF SWP
S27 RP PB MODE
S33 REC C RF
S37 ME/MP
S32 REC Y RF
S34 REC AFM RF
G2 RP GND
P1 RP 4.9V
S31 MT 1CH
S38 JOG
S25 H CHG
S28 PB RF
S29 MT 'CH
S24 FE ON
CN001 JST 1.5MM
5 RP GND
4 RF SWP
3 PB RF
2 PB PCM RF
1 PB 'CH RF
CHECK PIN
TO CS-37 BOARD (5/5)
(SERVO/SYSTEM CONTROL BLOCK)
(See Page 105)

CS-37 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

- Refer to page 85 for Printed Wiring Board.

— Ref. No. CS-37 BOARD: 1000 series —


IC507 CXA1448N BATTERY DETECT
IC508 S-81350HG 5V REG
IC506 μPD75316GF MODE CONTROL (MASTER)
IC509 μPD7564 SIRCS CONTROL
IC511 AK6420F EEP ROM
Q507 INVERTER
CN505 16P NON ZIF
TO CK-61 BOARD W561
(See Page 129)
CN507 15P NON ZIF
(See Page 127)
TO PJ-50 BOARD CN550 (10-12PIN) FP-511 (FLEXIBLE)
TO VK-28 BOARD W570 (1-10PIN) FP-511 (FLEXIBLE)
(See Page 128)
CN501 48P B.TO.B
TO PS-308 BOARD CN950
(See Page 140)
TO CS-37 BOARD (3/5) (CAMERA (3) BLOCK)
(See Page 99)
TO CS-37 BOARD (2/5) (CAMERA (2) BLOCK)
(See Page 94, 96)
TO MD BLOCK CN004
(See Page 131)
CN504 20P B.TO.B
TO VA-77 BOARD CN202
(See Page 116)
CN502 30P B.TO.B L.0
TO SL-28 BO
(See Pag



CAM GND
MT 5V
MT GND
SS GND
BACK UP Vdd
EVER 5V
VTR SYNC
TO STBY 1
CR PULS
S RAM CS
TITLE CS
TITLE BUSY
FLD
TO MD BLOCK CN004
(See Page 131)
CN502 30P B.TO.B L.D
CAP FG
UNREG
CAP FWD/REV
VS
STBY
UNREG GND
DEW SENS
SS 4.9V
S REEL FG
T REEL FG
END LED
SS GND
MP/ME
T/E LED
REC PROF
LOAD
M SW 0
W
M SW 1
REEL HALL COM
M SW 2
U
CC DOWN
V
D PG
COM
TOP SENS
UNLOAD
D FG
MT 5V
TO SL-28 BOARD W500
(See Page 131, 132)
Q501 DTC114EU-T1 SWITCH
Q502, 510, 511 SILENCER
IC505 CXA8006M DRUM MOTOR DRIVE, LPF
Q503 SWITCH
IC510 MPC1720M-EL LOADING MOTOR DRIVE
Q509 5V REG
IC503 CXP80624 SERVO/SYSTEM CONTROL
UNLOAD
LOAD
LM LIM CON
COMP REC
DRUM REV
REEL HALL CONT
MP
RESET
XTAL
EXTAL
COSMO CS
DATA TO SLEV
DATA TO MSTR
SCK
AUDIO MUTE
1.7M OFF
H CHG
RF SWP
VI SWP
VA PB MODE
AU IN/OUT
SP/LP
DRUM BLK
DRUM ACC
REF PILOT
DRUM ON
AGC SLOW
LIMIT CONT
CN504 20P B.TO.B
EP L OUT
EP GND
AUDIO GND
AUDIO GND
REC AFM RF
AUDIO 4.9V
AUDIO MUTE
EVF OUT
DS ON
VTR SYNC
CAM Y
AUDIO IN/OUT
CAM C
Y CHK
DDS VOW
DDS VOB
DS VOW
DS VOB
AFC H
CAM FSC
TO VA-77 BOARD CN202
(See Page 118)
CN503 40P B.TO.B
EC VIDEO OUT
EC RFU DC OUT
VIDEO GND
EC AUDIO L OUT
EC AUDIO MIX OUT
EC AUDIO R OUT
AUDIO GND
MT 1CH
REC Y RF
MT 2CH
REC C RF
MT 'CH
VIDEO GND
VIDEO GND
PB RF
VIDEO GND
VI SWP
OUT SW
VIDEO 4.9V
VIDEO 4.9V
SYNC SLOW
AGC SLOW
IN SW
E MODE
E/L DET
JOG Vd
EDIT
V MUTE
JOG
H CHG
ME/MP
RF SWP
VA PB MODE
CAM/LINE
SP/LP
ATF CONT
VIDEO D/A CS
VIDEO CS
SCK
DATA TO SLVE
TO VA-77 BOARD CN201
(See Page 116, 117)
RP GND
RP 4.9V
SP/LP
JOG
ME/MP
RF SWP
FE ON
H CHG
RP PB MODE
TO CS-37 BOARD RP AMP BL
(See Page
PS501 CCP2E20 0.8A
8
9
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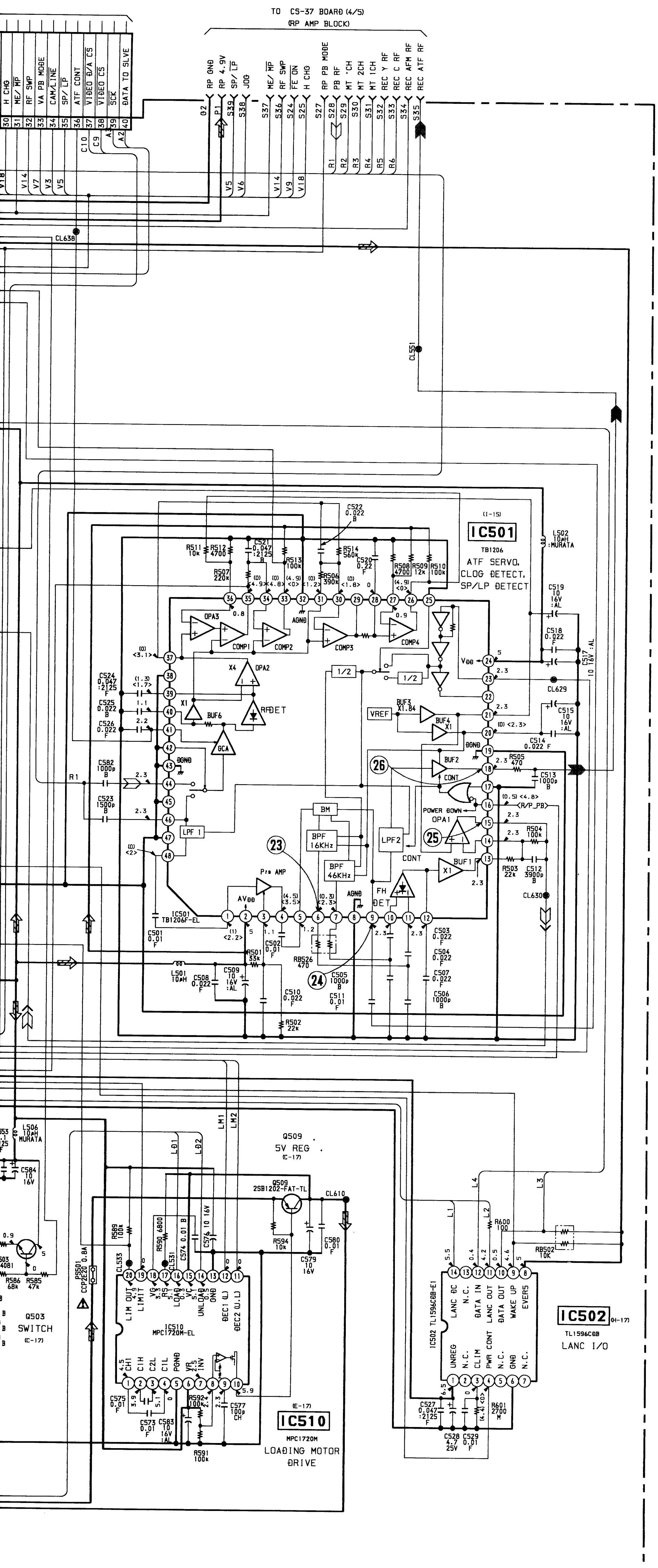
12
13
14
15
16
17
18

CS-37 BOARD (5/5)

(See Page 101)


TO CS-37 BOARD (4/5)
(RP AMP BLOCK)
H CHG
ME/MP
RF SWP
VA PB MODE
CAM/LINE
SP/LP
ATF CONT
VIDEO D/A CS
VIDEO CS
SCK
DATA TO SLVE
RP GND
RP 4.9V
SP/LP
JOG
ME/MP
RF SWP
FE ON
H CHG
RP PB MODE
PB RF
MT 'CH
MT 2CH
MT 1CH
REC Y RF
REC C RF
REC AFM RF
REC ATF RF
IC501
TB1206
ATF SERVO,
CLOG DETECT,
SP/LP DETECT
IC501
TB1206F-EL
OPA3
OPA2
COMP1
COMP2
COMP3
COMP4
AGND
BUF6
RFDET
GCA
LPF1
LPF2
BM
BPF 16KHz
BPF 46KHz
Pre AMP
AVDD
FH DET
CONT
BUF1
BUF2
BUF3 X1.84
BUF4 X1
VREF
POWER DOWN
OPA1
1/2
VDD
Q509
5V REG
2SB1202-FAT-TL
IC510
MPC1720M-EL
LIM OUT
LIMIT
VG
RS
LOAD
VC
UNLOAD
GND
DEC1 (L)
DEC2 (U.L)
CH1
C1H
C2L
C1L
PGND
VR
INV
IC510
MPC1720M
LOADING MOTOR
DRIVE
Q503
SWITCH
IC502 TL1596C0B-E1
UNREG
N.C.
CLIM
PWR CONT
N.C.
GND
N.C.
LANC DC
N.C.
DATA IN
LANC OUT
DATA OUT
WAKE UP
EVERS
IC502
TL1596C0B
LANC I/O
23
24
25
26

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

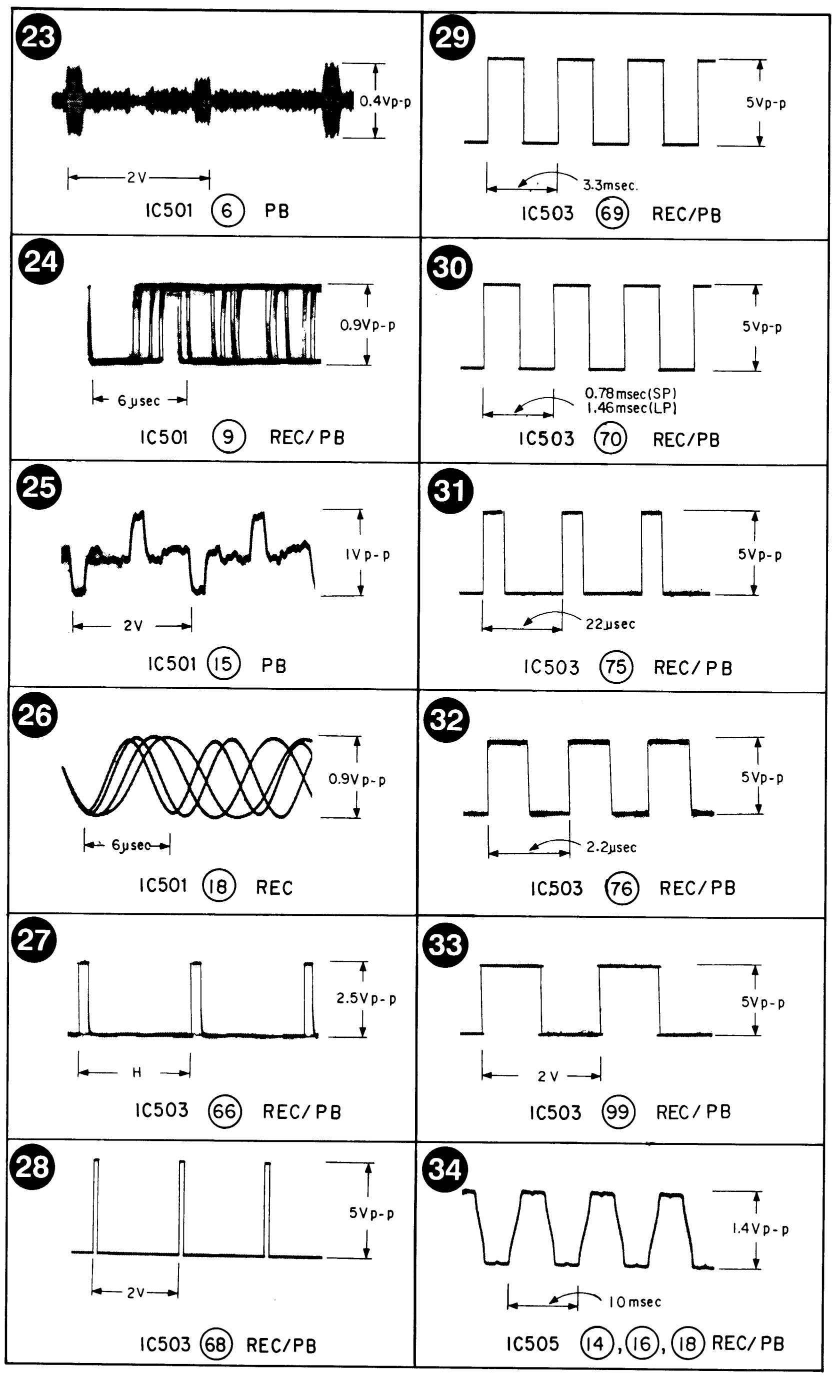
CS-37 BOARD (5/5) (SERVO/SYSTEM CONTROL BLOCK)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	➡
PB	⇨	⇨»	⇨»»	⇨

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo			
Capstan phase servo	➤»	➤»	⊃»
Capstan servo (speed and phase)			
Ref. signal	➤	➤	⊃

CS-37 BOARD (5/5)



〈 DIODE 〉

D102	8-719-800-76	DIODE	1SS226
D201	8-719-941-86	DIODE	DAN202U
D202	8-719-941-86	DIODE	DAN202U
D203	8-719-941-09	DIODE	DAP202U
D205	8-719-941-86	DIODE	DAN202U
D206	8-719-941-86	DIODE	DAN202U
D301	8-719-940-45	DIODE	DWA010
D361	8-719-941-86	DIODE	DAN202U
D362	8-719-941-86	DIODE	DAN202U
D401	8-719-105-32	DIODE	RD2.7M-B2

〈 IC 〉

IC051	8-752-333-24	IC	CXL1506M
IC052	8-759-710-29	IC	NJM2235M
IC053	8-759-031-84	IC	SC7S04F
IC054	8-752-053-21	IC	CXA1211M
IC201	8-752-036-19	IC	CXA1207R
IC202	8-759-710-29	IC	NJM2235M
IC203	8-759-055-82	IC	M62353GP
IC204	8-759-055-82	IC	M62353GP
IC205	8-759-636-33	IC	CXA1452N
IC206	8-752-053-21	IC	CXA1211M
IC301	8-752-036-20	IC	CXA1208R
IC361	8-759-605-61	IC	CXA1203N
IC400	8-759-234-77	IC	TC4S66F
IC401	8-759-824-22	IC	CXA1535R

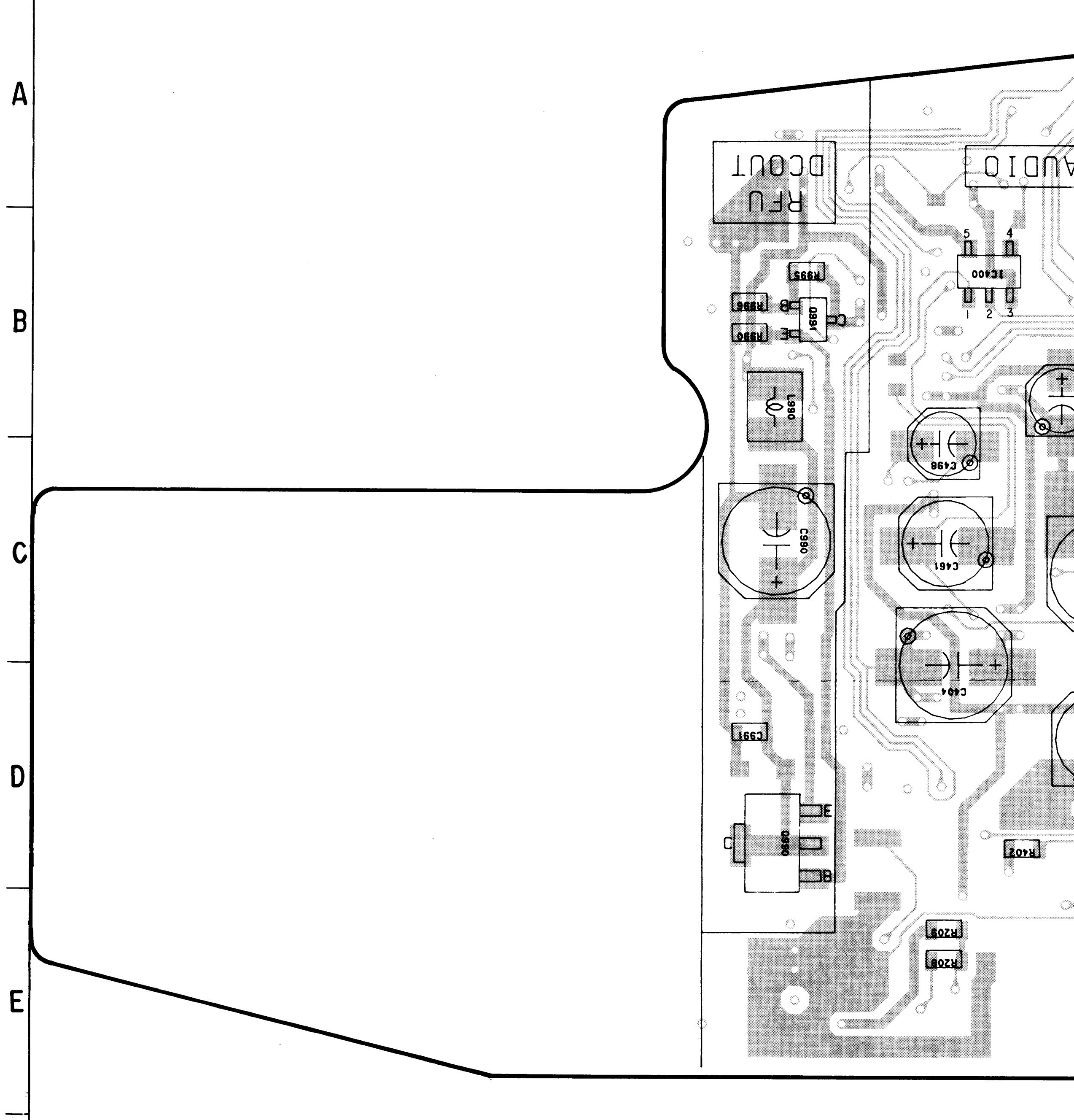
〈 TRANSISTOR 〉

Q051	8-729-920-48	TRANSISTOR	IMH2
Q052	8-729-141-48	TRANSISTOR	2SB624-BV345
Q053	8-729-905-23	TRANSISTOR	2SA1576-R
Q054	8-729-905-23	TRANSISTOR	2SA1576-R
Q055	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q056	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q057	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q060	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q061	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q063	8-729-422-54	TRANSISTOR	XN4215
Q064	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q065	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q066	8-729-905-23	TRANSISTOR	2SA1576-R
Q067	8-729-905-96	TRANSISTOR	DTA114TU
Q103	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q104	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q110	8-729-920-XX	TRANSISTOR	DTA114EU
Q111	8-729-102-07	TRANSISTOR	2SC2223-F13
Q114	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q118	8-729-920-48	TRANSISTOR	IMH2
Q119	8-729-905-23	TRANSISTOR	2SA1576-R
Q120	8-729-102-07	TRANSISTOR	2SC2223-F13
Q121	8-729-905-23	TRANSISTOR	2SA1576-R
Q122	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q202	8-729-905-23	TRANSISTOR	2SA1576-R
Q204	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q207	8-729-905-12	TRANSISTOR	DTA144EU
Q212	8-729-920-48	TRANSISTOR	IMH2
Q213	8-729-905-18	TRANSISTOR	DTC144EU
Q214	8-729-106-60	TRANSISTOR	2SB1115A-YQ
Q215	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q216	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q217	8-729-905-12	TRANSISTOR	DTA144EU
Q218	8-729-402-81	TRANSISTOR	XN4501
Q220	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q222	8-729-402-81	TRANSISTOR	XN4501
Q223	8-729-905-12	TRANSISTOR	DTA144EU
Q224	8-729-905-18	TRANSISTOR	DTC144EU
Q225	8-729-905-18	TRANSISTOR	DTC144EU
Q227	8-729-905-18	TRANSISTOR	DTC144EU
Q228	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q229	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q230	8-729-905-23	TRANSISTOR	2SA1576-R
Q231	8-729-925-42	TRANSISTOR	IMT2
Q232	8-729-905-23	TRANSISTOR	2SA1576-R
Q233	8-729-925-42	TRANSISTOR	IMT2
Q234	8-729-905-18	TRANSISTOR	DTC144EU
Q235	8-729-905-23	TRANSISTOR	2SA1576-R
Q302	8-729-402-81	TRANSISTOR	XN4501
Q304	8-729-905-12	TRANSISTOR	DTA144EU
Q306	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q307	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q308	8-729-905-23	TRANSISTOR	2SA1576-R
Q309	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q310	8-729-905-18	TRANSISTOR	DTC144EU
Q311	8-729-905-23	TRANSISTOR	2SA1576-R
Q312	8-729-420-20	TRANSISTOR	XN4312
Q313	8-729-905-12	TRANSISTOR	DTA144EU
Q314	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q315	8-729-905-12	TRANSISTOR	DTA144EU
Q316	8-729-920-48	TRANSISTOR	IMH2
Q317	8-729-420-20	TRANSISTOR	XN4312
Q318	8-729-905-18	TRANSISTOR	DTC144EU
Q319	8-729-905-18	TRANSISTOR	DTC144EU
Q361	8-729-102-07	TRANSISTOR	2SC2223-F13
Q362	8-729-905-18	TRANSISTOR	DTC144EU
Q363	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q364	8-729-905-12	TRANSISTOR	DTA144EU
Q365	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q366	8-729-905-18	TRANSISTOR	DTC144EU
Q367	8-729-905-18	TRANSISTOR	DTC144EU
Q368	8-729-905-12	TRANSISTOR	DTA144EU
Q401	8-729-921-08	TRANSISTOR	DTC144TU
Q402	8-729-905-18	TRANSISTOR	DTC144EU
Q990	8-729-106-60	TRANSISTOR	2SB1115A-YQ
Q991	8-729-120-28	TRANSISTOR	2SC1623-L5L6

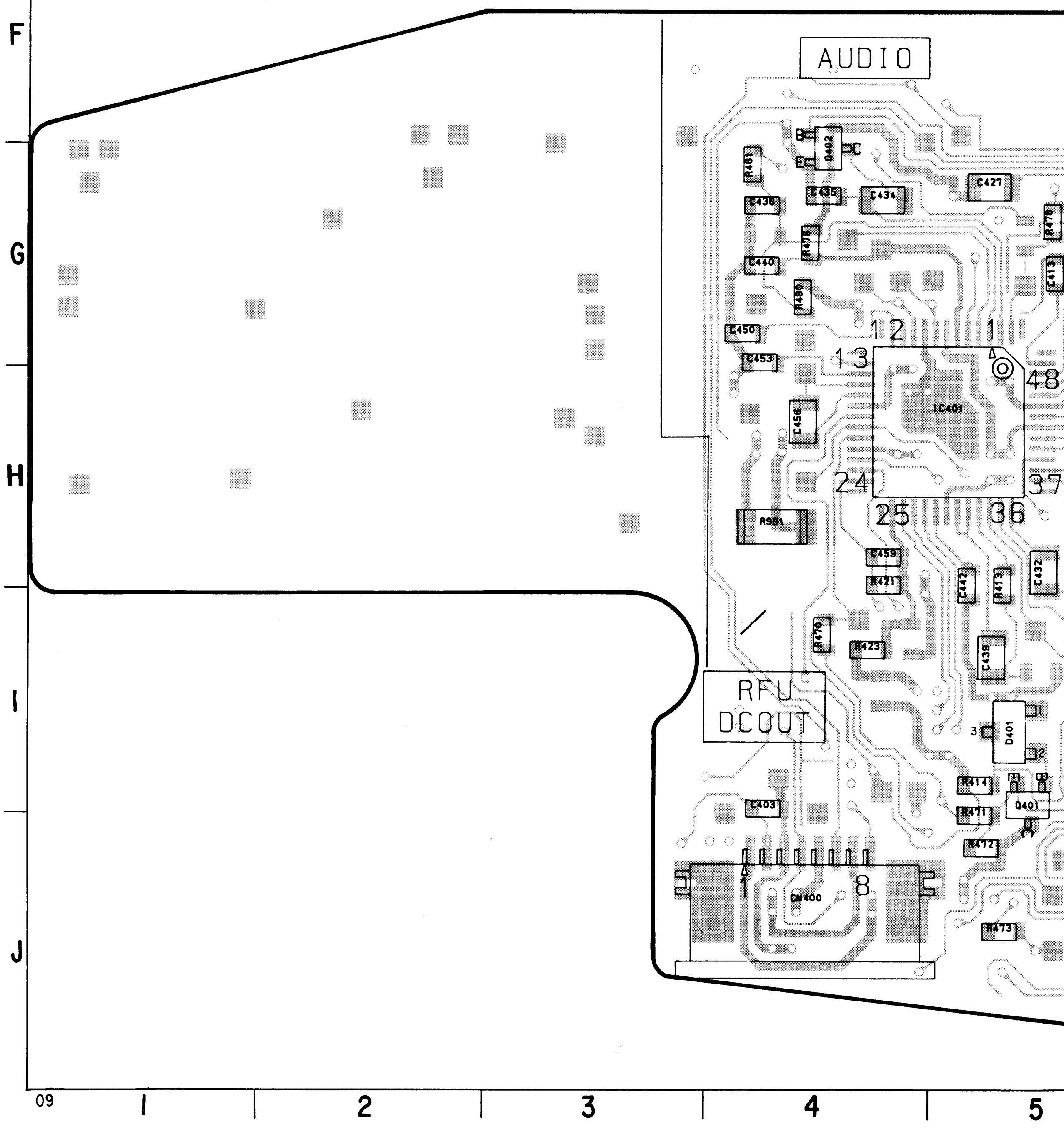
VA-77 (VIDEO, AUDIO (MONO)) PRINTED WIRING BOARDS

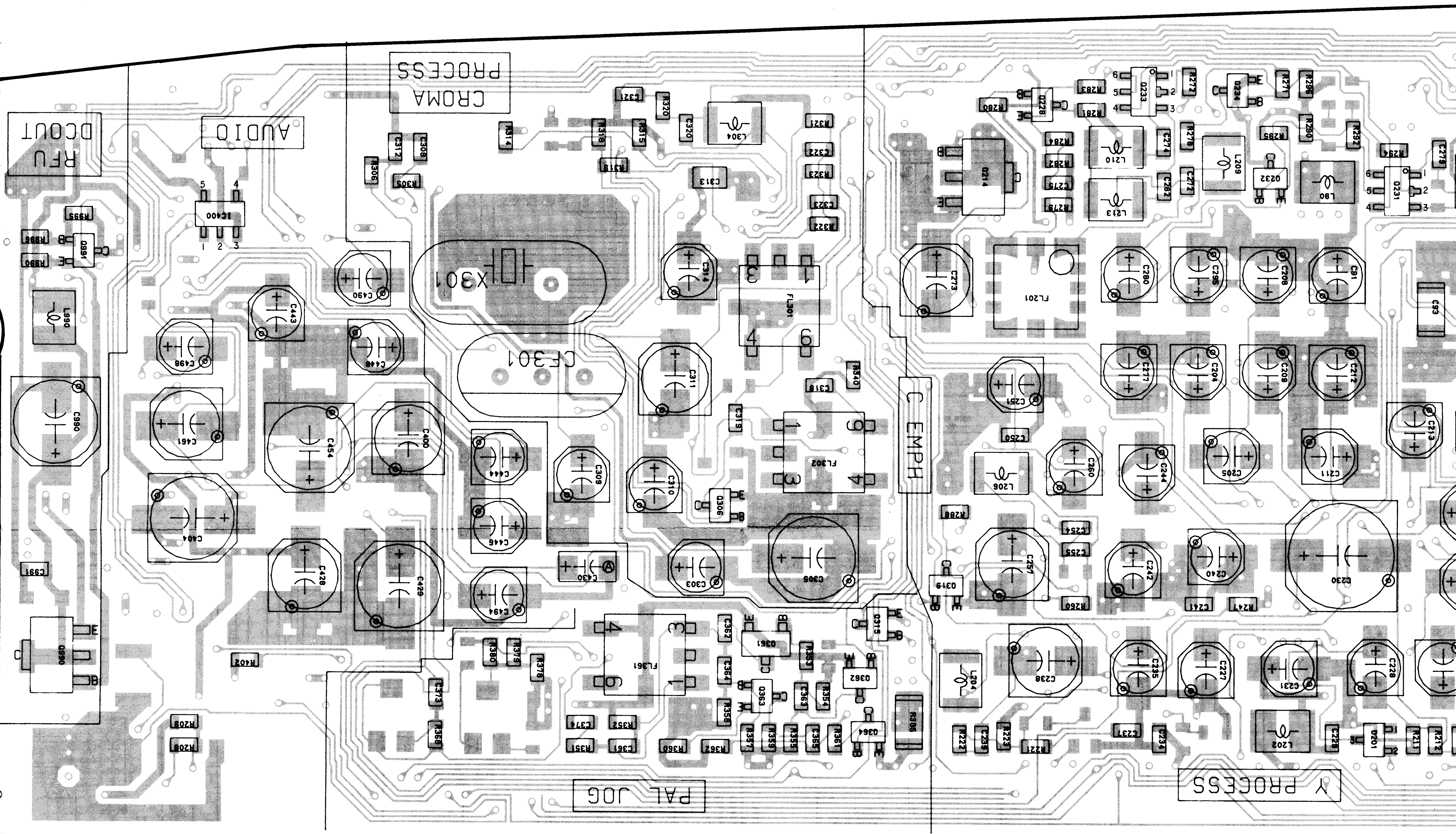
— Ref. No. VA-77 BOARD: 1000 series —

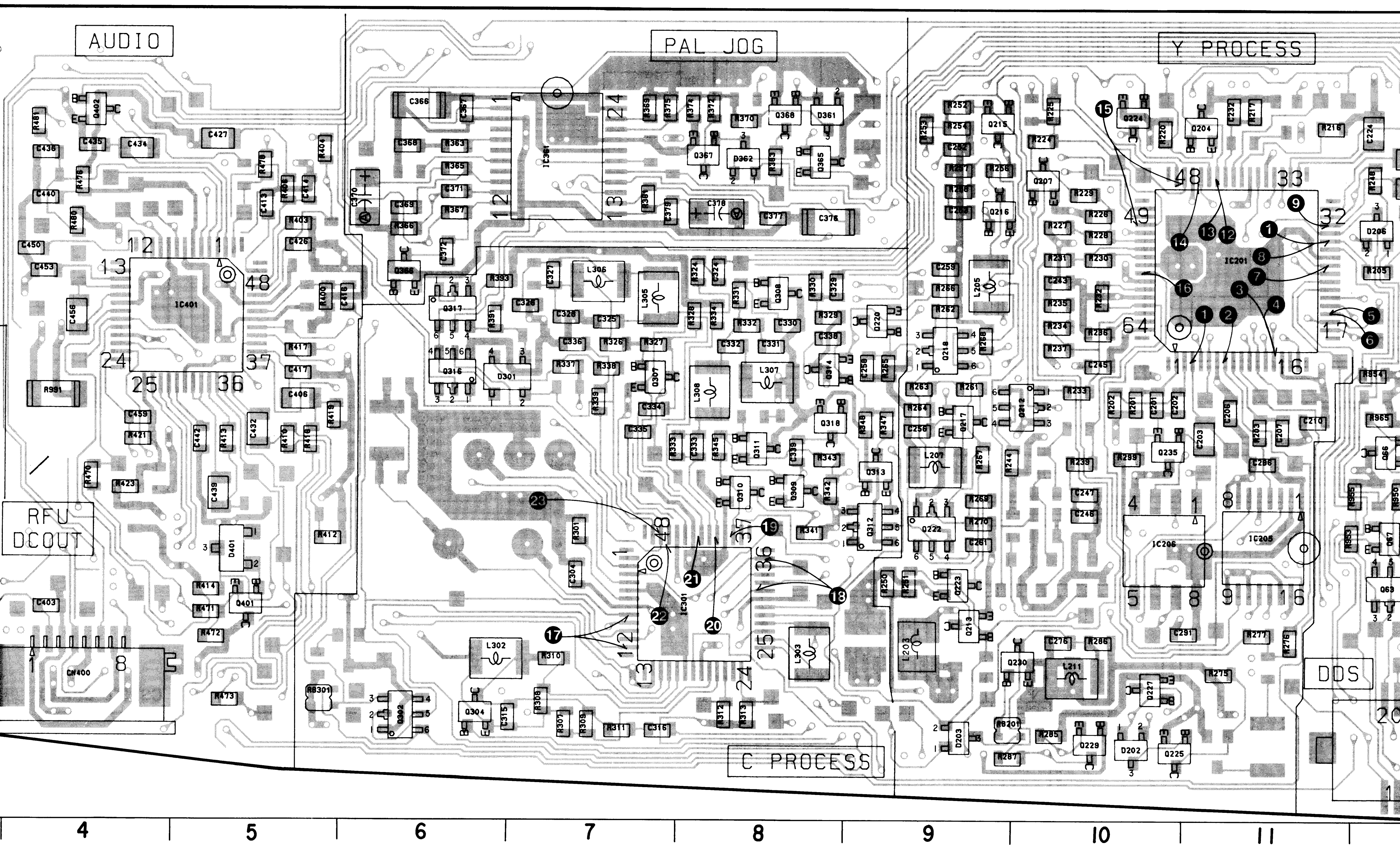
VA-77 BOARD (COMPONENT SIDE)



VA-77 BOARD (CONDUCTOR SIDE)




RFU DCOUT
AUDIO
CROMA PROCESS
C EMPH
PAL JOG
Y PROCESS
X301
CF301
IC400
FL301
FL302
FL361
FL201


AUDIO
PAL JOG
Y PROCESS
RFU DCOUT
C PROCESS
DDS
IC401
IC361
IC301
IC201
IC206
IC205
CN400
4
5
6
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9
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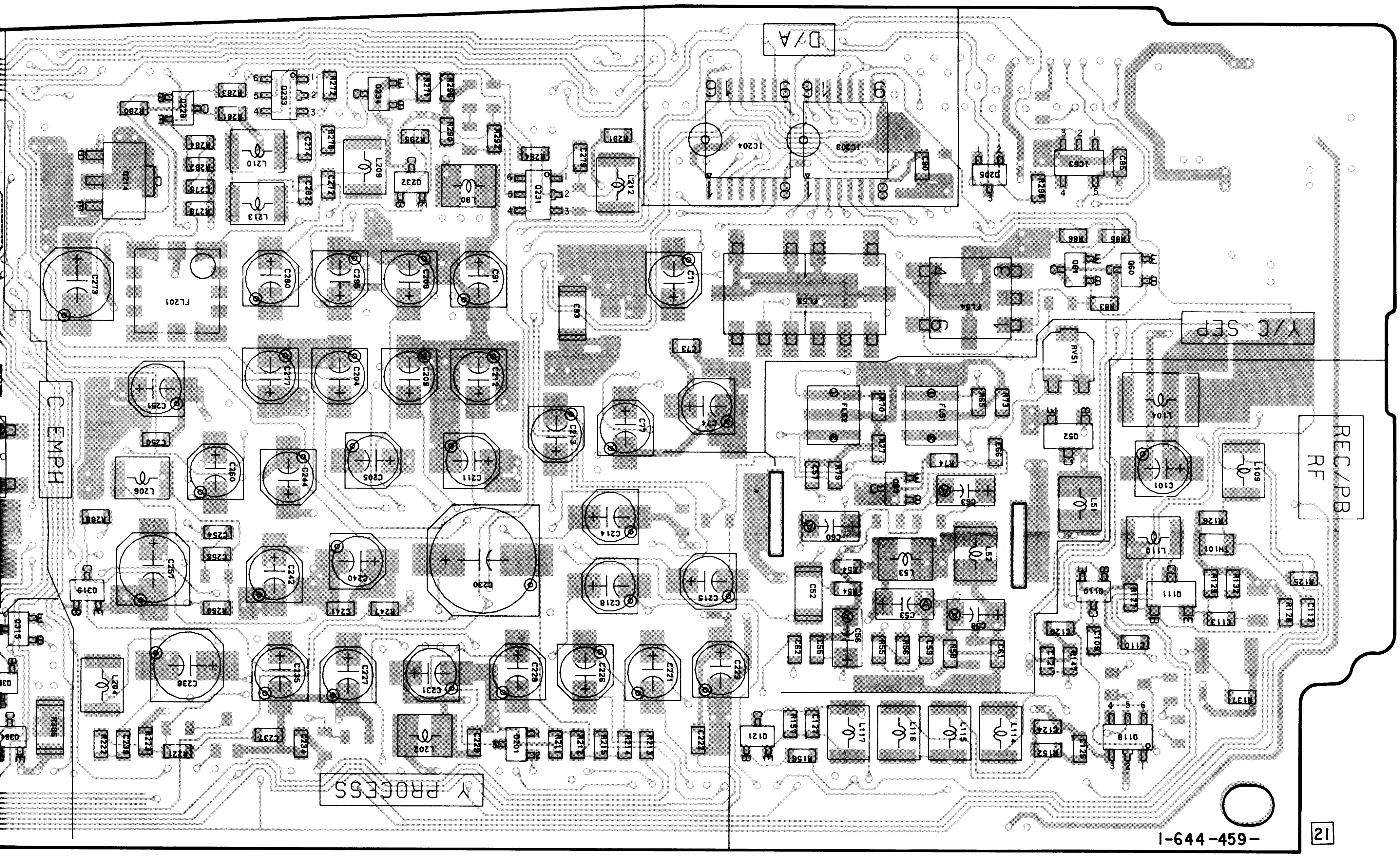
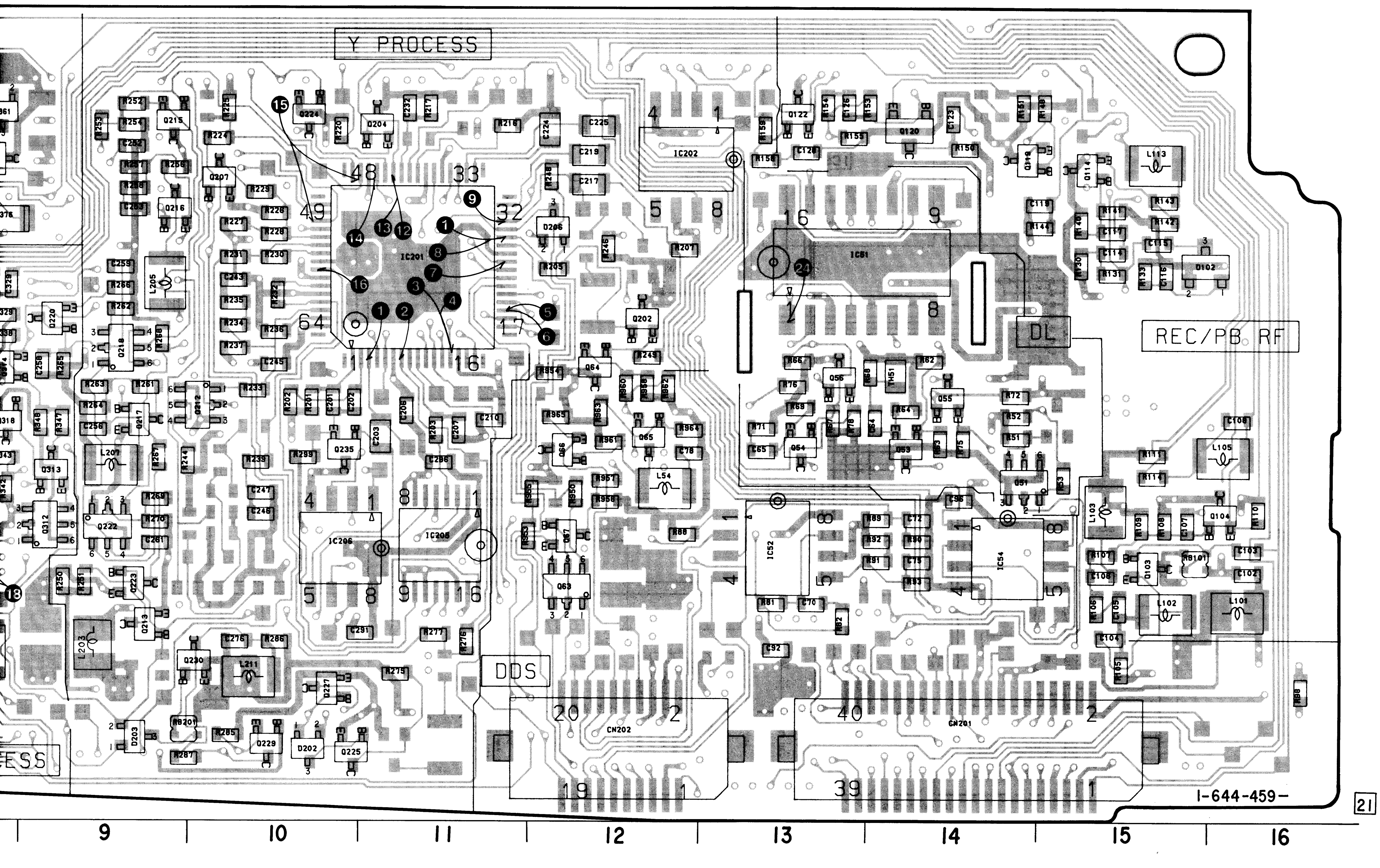
11


D/A
C EMPH
Y/C SEP
REC/PB RF
Y PROCESS
IC204
IC203
FL201
FL53
FL54
1-644-459-
21


Y PROCESS
IC201
IC202
IC205
IC206
IC81
IC52
IC54
DL
REC/PB RF
DDS
CN202
CN201
1-644-459-
21
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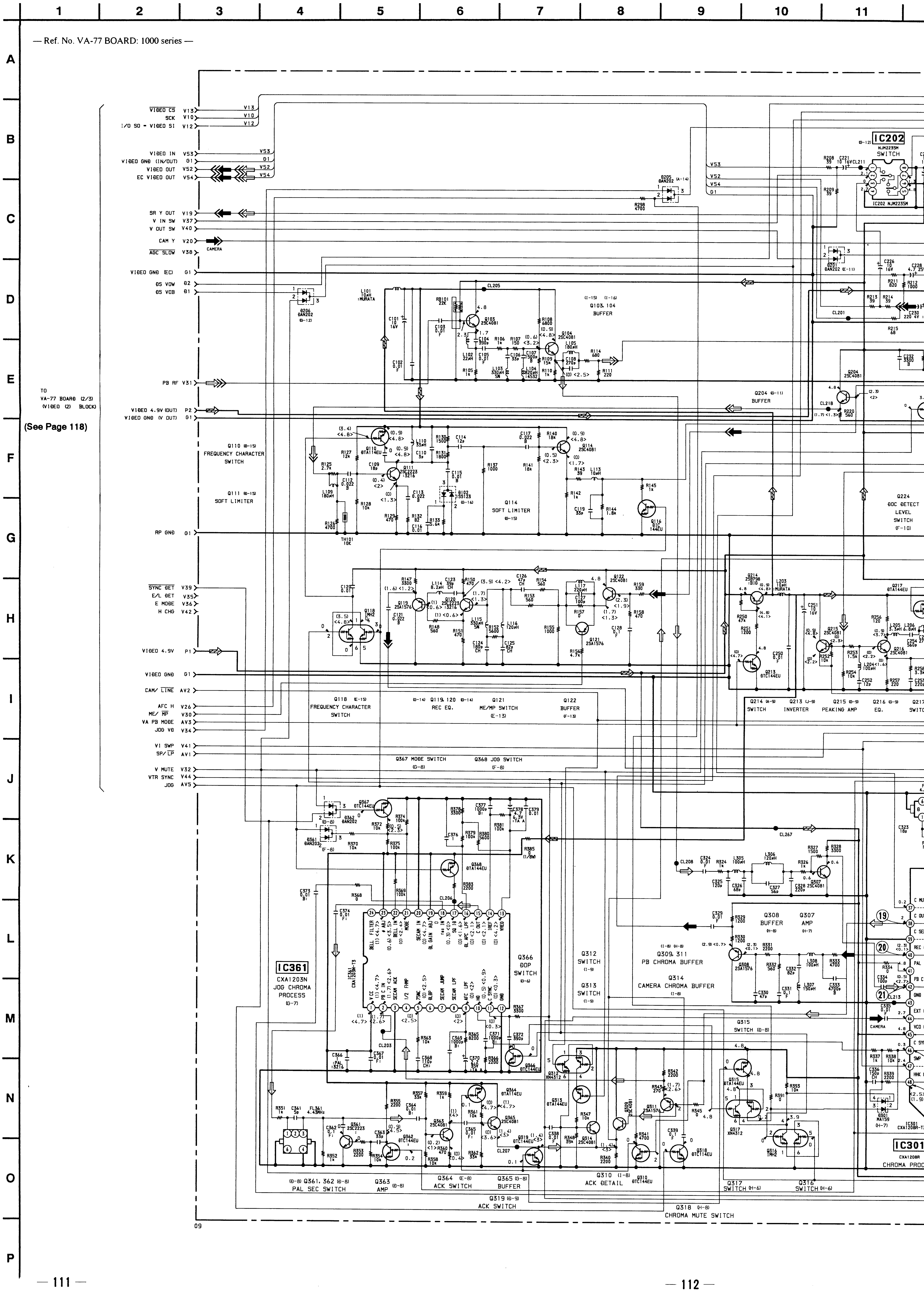
16

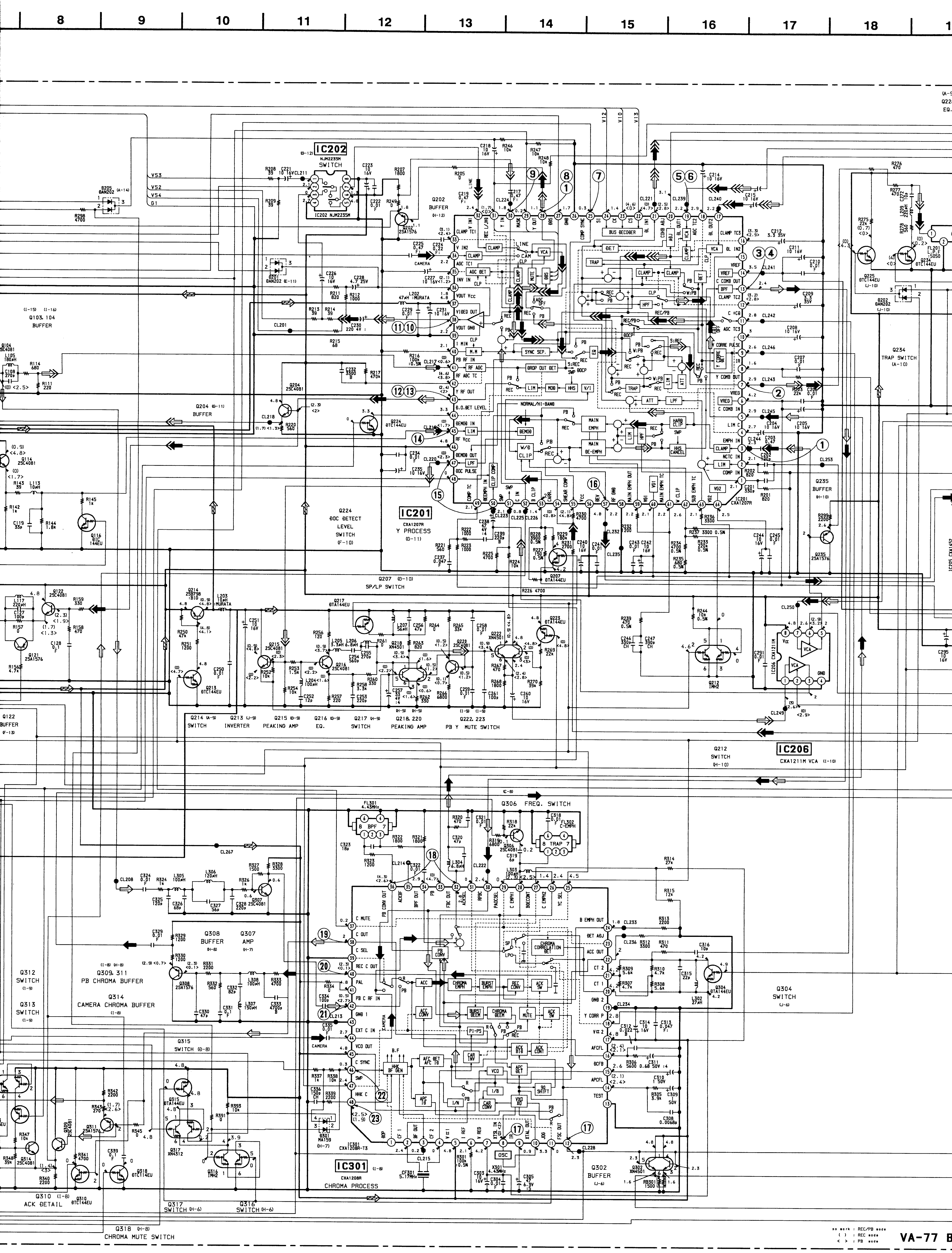
VA-77 (VIDEO) SCHEMATIC DIAGRAM

- Refer to page 107 for Printed Wiring Board.

— Ref. No. VA-77 BOARD: 1000 series —

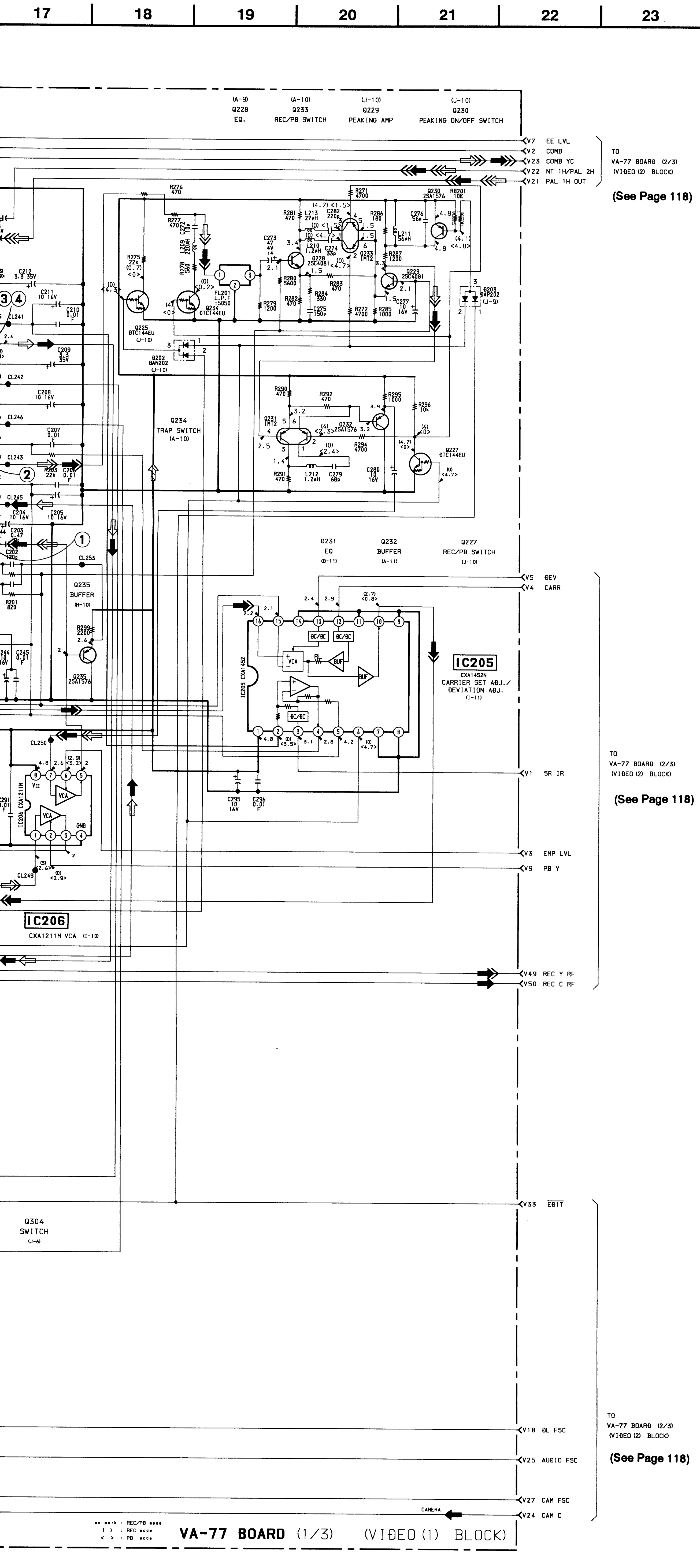


TO
VA-77 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 118)
VIDEO CS V13
SCK V10
I/O SO = VIDEO SI V12
VIDEO IN V53
VIDEO GND (IN/OUT) G1
VIDEO OUT V52
EC VIDEO OUT V54
SR Y OUT V19
V IN SW V37
V OUT SW V40
CAM Y V20
CAMERA
AGC SLOW V38
VIDEO GND (EC) G1
DS VDW D2
DS VDB D1
PB RF V31
VIDEO 4.9V (OUT) P2
VIDEO GND (V OUT) G1
RP GND G1
SYNC DET V39
E/L DET V35
E MODE V36
H CHG V42
VIDEO 4.9V P1
VIDEO GND G1
CAM/ LINE AV2
AFC H V26
ME/ MP V30
VA PB MODE AV3
JOG VD V34
VI SWP V41
SP/ LP AV1
V MUTE V32
VTR SYNC V44
JOG AV5
Q103, 104 BUFFER
Q110 FREQUENCY CHARACTER SWITCH
Q111 SOFT LIMITER
Q114 SOFT LIMITER
Q118 FREQUENCY CHARACTER SWITCH
Q119, 120 REC EQ.
Q121 ME/MP SWITCH
Q122 BUFFER
Q204 BUFFER
Q214 SWITCH
Q213 INVERTER
Q215 PEAKING AMP
Q216 EQ.
Q224 DOC DETECT LEVEL SWITCH
IC202 NJM2235M SWITCH
Q367 MODE SWITCH
Q368 JOG SWITCH
IC361 CXA1203N JOG CHROMA PROCESS
Q366 DOP SWITCH
Q312 SWITCH
Q313 SWITCH
Q308 BUFFER
Q307 AMP
Q309, 311 PB CHROMA BUFFER
Q314 CAMERA CHROMA BUFFER
Q315 SWITCH
Q361, 362 PAL SEC SWITCH
Q363 AMP
Q364 ACK SWITCH
Q365 BUFFER
Q319 ACK SWITCH
Q310 ACK DETAIL
Q318 CHROMA MUTE SWITCH
Q317 SWITCH
Q316 SWITCH
IC301 CXA1208R CHROMA PROC


8
9
10
11
12
13
14
15
16
17
18
IC202
NJM2235M
SWITCH
IC202 NJM2235M
Q202
BUFFER
(H-12)
Q103, 104
BUFFER
Q204 (G-11)
BUFFER
Q224
BOC DETECT
LEVEL
SWITCH
(F-10)
IC201
CXA1207R
Y PROCESS
(G-11)
Q207 (G-10)
SP/LP SWITCH
Q235
BUFFER
(H-10)
Q234
TRAP SWITCH
(A-10)
Q214 (A-9)
SWITCH
Q213 (J-9)
INVERTER
Q215 (G-9)
PEAKING AMP
Q216 (G-9)
EQ.
Q217 (H-9)
SWITCH
Q218, 220
PEAKING AMP
Q222, 223
PB Y MUTE SWITCH
Q122
BUFFER
(F-13)
Q212
SWITCH
(H-10)
IC206
CXA1211M VCA (I-10)
Q306 FREQ. SWITCH
Q308
BUFFER
(H-8)
Q307
AMP
(H-7)
Q309, 311
PB CHROMA BUFFER
Q314
CAMERA CHROMA BUFFER
(I-8)
Q312
SWITCH
Q313
SWITCH
Q315
SWITCH (G-8)
Q304
SWITCH
(J-6)
IC301
CXA1208R
CHROMA PROCESS
Q302
BUFFER
(J-6)
Q310 (I-8)
ACK DETAIL
Q317
SWITCH (H-6)
Q316
SWITCH (H-6)
Q318 (H-8)
CHROMA MUTE SWITCH

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

VA-77 B


17
18
19
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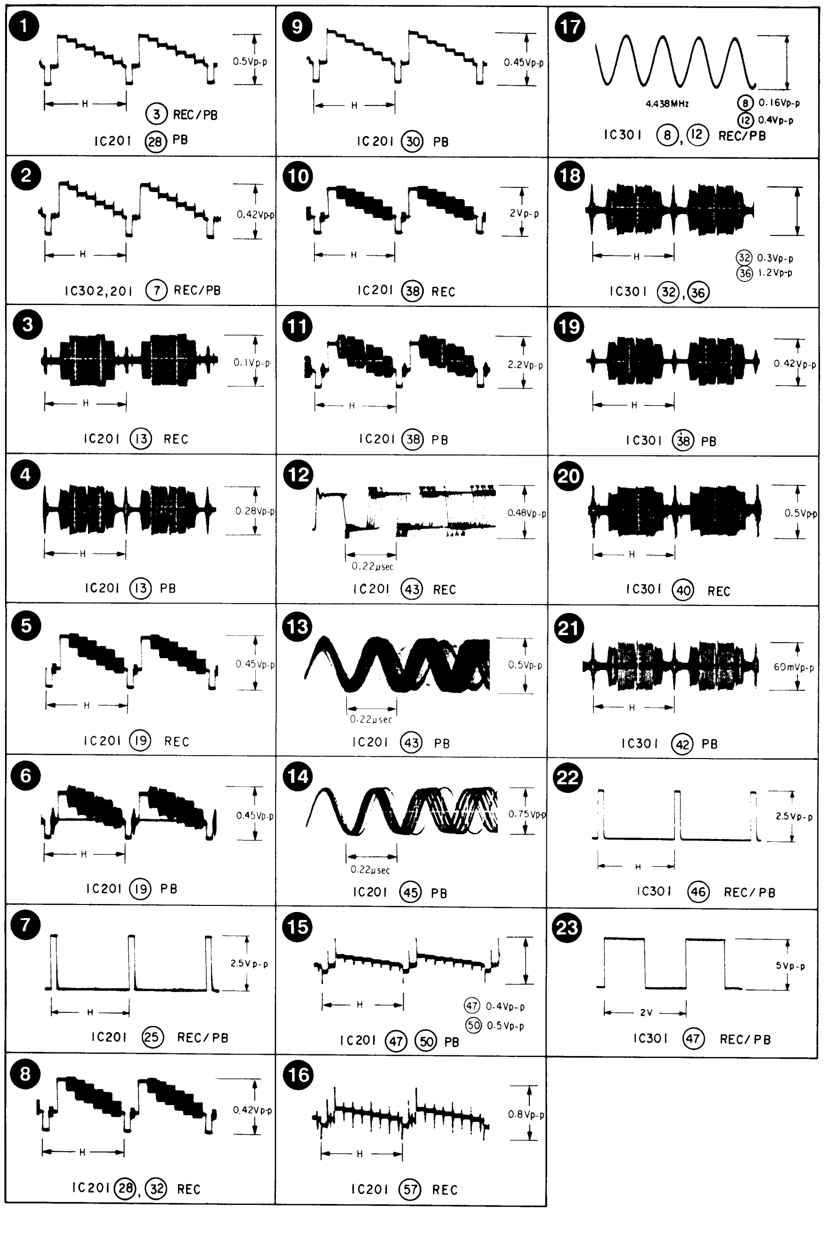
25
26
27
28
(A-9) Q228 EQ.
(A-10) Q233 REC/PB SWITCH
(J-10) Q229 PEAKING AMP
(J-10) Q230 PEAKING ON/OFF SWITCH
V7 EE LVL
V2 COMB
V23 COMB YC
V22 NT 1H/PAL 2H
V21 PAL 1H OUT
TO VA-77 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 118)
R276 470
R277 470
C272 10p
L209 220μH
R278 560
R275 22k
FL201 L.P.F :5050
Q225 DTC144EU (J-10)
Q234 DTC144EU
D202 DAN202 (J-10)
C273 47 4V
Q228 2SC4081
R280 5600
R279 1200
R281 470
L213 27μH
C282 220p
L210 1.2μH
C274 33p
Q233 IMT2
R282 470
R283 470
R284 330
C275 150p
R271 4700
R272 4700
R286 180
L211 56μH
R287 1200
Q229 2SC4081
R285 1000
C277 10 16V
Q230 2SA1576
RB201 10K
C276 56p
D203 DAP202 (J-9)
C212 3.3 35V
C211 10 16V
C210 0.01 F
CL241
C209 3.3 35V
CL242
C208 10 16V
CL246
C207 0.01 F
CL243
R203 22k
C206 0.01 F
CL245
C204 10 16V
C205 10 16V
C203 0.47
C202 120p
CL253
R201 820
Q234 TRAP SWITCH (A-10)
R290 470
R292 470
R295 1000
R296 10k
Q231 IMT2
Q232 2SA1576
R294 4700
R291 470
L212 1.2μH
C279 68p
C280 10 16V
Q227 DTC144EU
Q231 EQ (B-11)
Q232 BUFFER (A-11)
Q227 REC/PB SWITCH (J-10)
Q235 BUFFER (H-10)
R299 2200
Q235 2SA1576
C244 10 16V
C245 0.01 F
V5 DEV
V4 CARR
IC205 CXA1452
BC/BC
VCA
BUF
RL
IC205
CXA1452N
CARRIER SET ADJ./
DEVIATION ADJ.
(I-11)
C295 10 16V
C296 0.01 F
V1 SR IR
TO VA-77 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 118)
CL250
IC206 CXA1211M
Vcc
GND
C291 0.01 F
CL249
IC206
CXA1211M VCA (I-10)
V3 EMP LVL
V9 PB Y
V49 REC Y RF
V50 REC C RF
V33 EDIT
Q304 SWITCH (J-6)
V18 DL FSC
V25 AUDIO FSC
V27 CAM FSC
CAMERA
V24 CAM C
TO VA-77 BOARD (2/3) (VIDEO (2) BLOCK)
(See Page 118)
no mark : REC/PB mode
( ) : REC mode
< > : PB mode

VA-77 BOARD (1/3) (VIDEO (1) BLOCK)

• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	
PB	⇨	⇨»	⇨⋙	

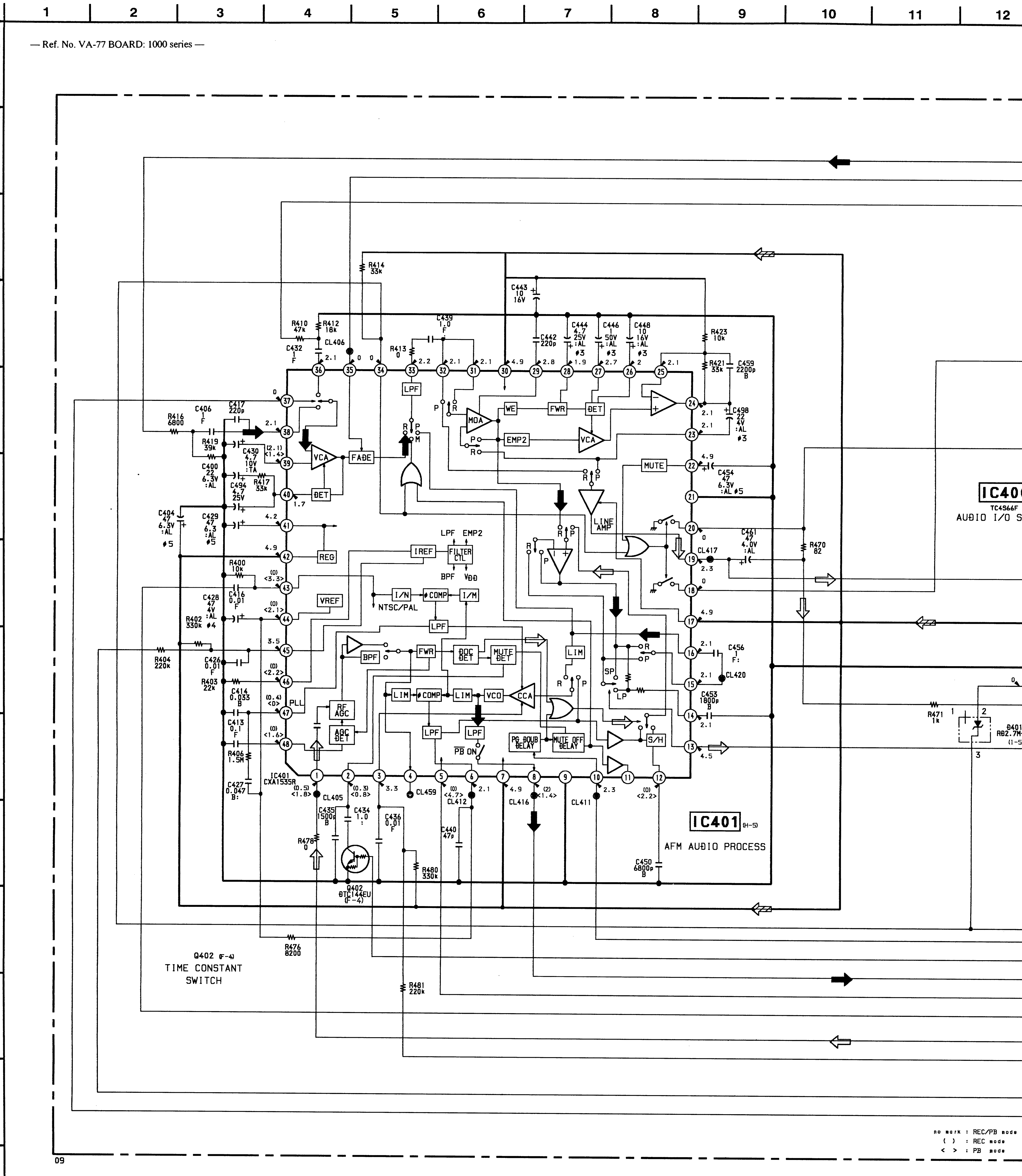
VA-77 BOARD (1/3)



VA-77 (AUDIO (MONO)) SCHEMATIC DIAGRAM

- Refer to page 107 for Printed Wiring Board.

— Ref. No. VA-77 BOARD: 1000 series —



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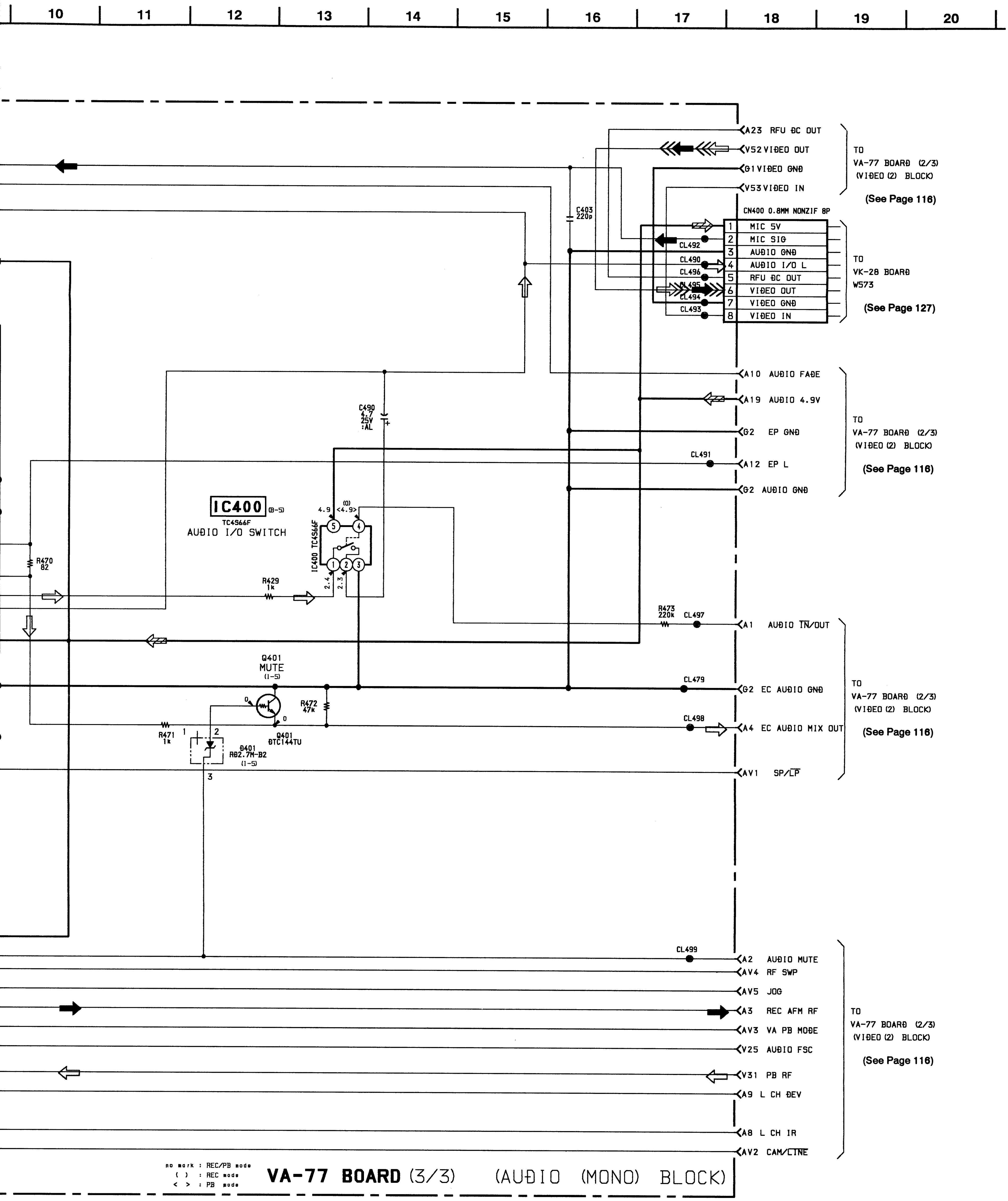
12
IC401 (H-5)
AFM AUDIO PROCESS
IC401
CXA1535R
IC40
TC4S66F
AUDIO I/O S
Q402 (F-4)
TIME CONSTANT
SWITCH
Q402
DTC144EU
(F-4)
D401
RD2.7M
VCA
FADE
DET
REG
VREF
IREF
FILTER CTL
LPF
EMP2
BPF
VDD
I/N
COMP
I/M
NTSC/PAL
BPF
FWR
DOC DET
MUTE DET
RF AGC
AGC DET
PLL
LIM
VCO
CCA
PB DOUB DELAY
MUTE OFF DELAY
PB ON
S/H
SP
LP
LINE AMP
MUTE
MOA
WE
R416 6800
R419 39k
C406 1 F
C417 220p
C430 4.7 10V :TA
C400 22 6.3V :AL
C494 4.7 25V
R417 33k
C404 47 6.3V :AL #5
C429 47 6.3 :AL #5
R400 10k
C428 47 4V :AL
R402 330k #4
C416 0.01 F
R404 220k
C426 0.01 F
R403 22k
C414 0.033 B
C413 0.1 F
R406 1.5M
C427 0.047 B:
C435 1500p B
C434 1.0
C436 0.01 F
R478 0
R480 330k
C440 47p
C450 6800p B
R476 8200
R481 220k
CL405
CL459
CL412
CL416
CL411
CL406
CL417
CL420
R410 47k
R412 18k
C432 1 F
R414 33k
R413 0
C439 1.0 F
C443 10 16V
C442 220p
C444 4.7 25V :AL #3
C446 1 50V :AL #3
C448 10 16V :AL #3
R423 10k
R421 33k
C459 2200p B
C498 22 4V :AL #3
C454 47 6.3V :AL #5
C461 47 4.0V :AL
R470 82
C456 1 F:
C453 1800p B
R471 1k

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

09

- SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡⋙	➡
PB			⇨⋙	⇨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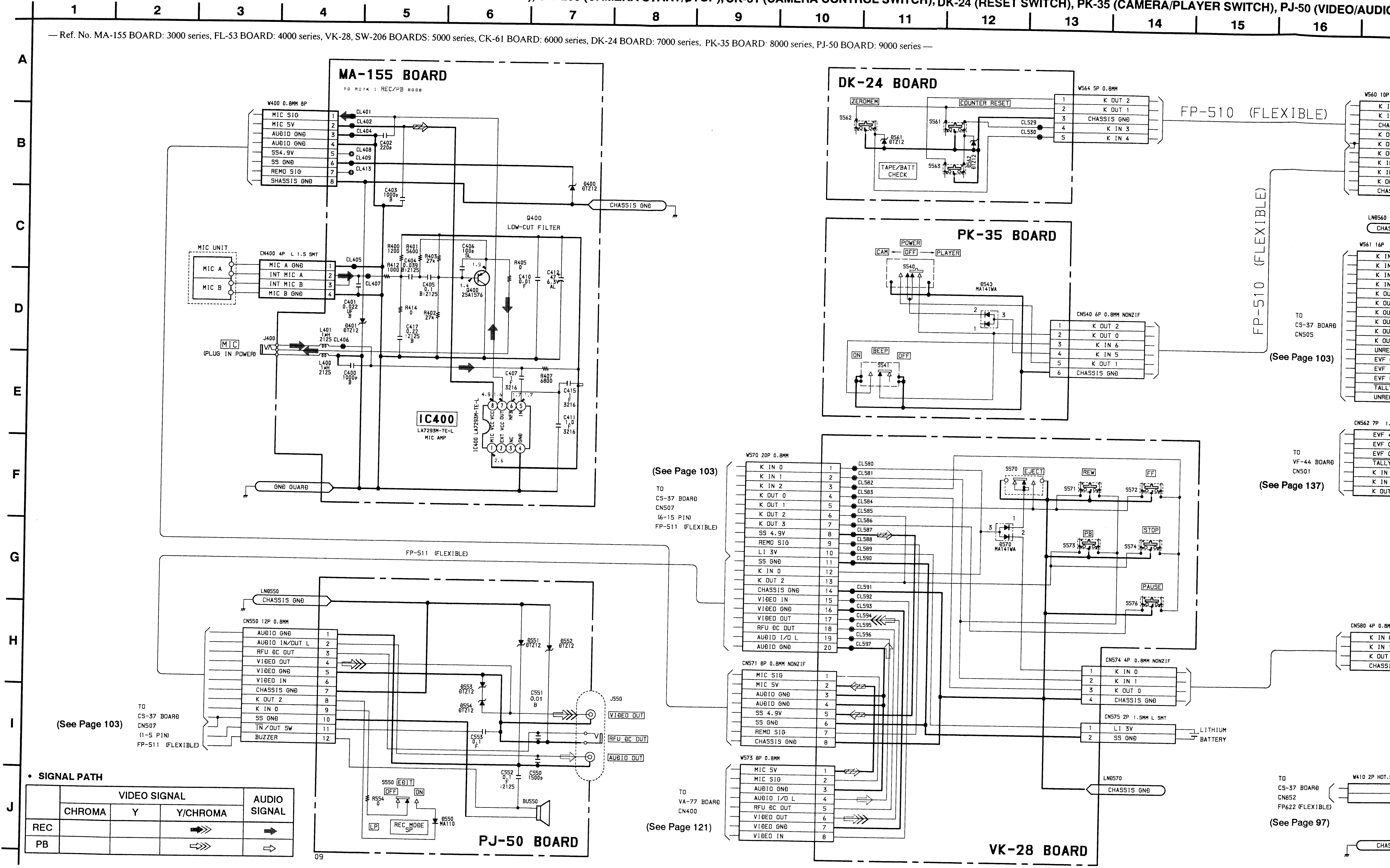
18
19
20
A23 RFU DC OUT
V52 VIDEO OUT
G1 VIDEO GND
V53 VIDEO IN
TO
VA-77 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 116)
C403
220p
CN400 0.8MM NONZIF 8P
1 MIC 5V
2 MIC SIG
3 AUDIO GND
4 AUDIO I/O L
5 RFU DC OUT
6 VIDEO OUT
7 VIDEO GND
8 VIDEO IN
CL492
CL490
CL496
CL495
CL494
CL493
TO
VK-28 BOARD
W573
(See Page 127)
A10 AUDIO FADE
A19 AUDIO 4.9V
G2 EP GND
A12 EP L
G2 AUDIO GND
CL491
TO
VA-77 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 116)
C490
4.7
25V
:AL
IC400 (B-5)
TC4S66F
AUDIO I/O SWITCH
IC400 TC4S66F
4.9
(0)
<4.9>
2.4
2.3
R470
82
R429
1k
R473
220k
CL497
A1 AUDIO IN/OUT
Q401
MUTE
(1-5)
R472
47k
CL479
G2 EC AUDIO GND
CL498
A4 EC AUDIO MIX OUT
R471
1k
Q401
DTC144TU
D401
RB2.7M-B2
(1-5)
AV1 SP/LP
TO
VA-77 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 116)
CL499
A2 AUDIO MUTE
AV4 RF SWP
AV5 JOG
A3 REC AFM RF
AV3 VA PB MODE
V25 AUDIO FSC
V31 PB RF
A9 L CH DEV
A8 L CH IR
AV2 CAM/LINE
TO
VA-77 BOARD (2/3)
(VIDEO (2) BLOCK)
(See Page 116)

no mark : REC/PB mode
( ) : REC mode
< > : PB mode

VA-77 BOARD (3/3) (AUDIO (MONO) BLOCK)

MA-155 (MIC AMP), VK-28 (VTR CONTROL SWITCH), FL-53 (PUSH FOCUS HOLD SWITCH), SW-206 (CAMERA START/STOP), CK-61 (CAMERA CONTROL SWITCH), DK-24 (RESET SWITCH), PK-35 (CAMERA/PLAYER SWITCH), PJ-50 (VIDEO/AUDI

— Ref. No. MA-155 BOARD: 3000 series, FL-53 BOARD: 4000 series, VK-28, SW-206 BOARDS: 5000 series, CK-61 BOARD: 6000 series, DK-24 BOARD: 7000 series, PK-35 BOARD: 8000 series, PJ-50 BOARD: 9000 series —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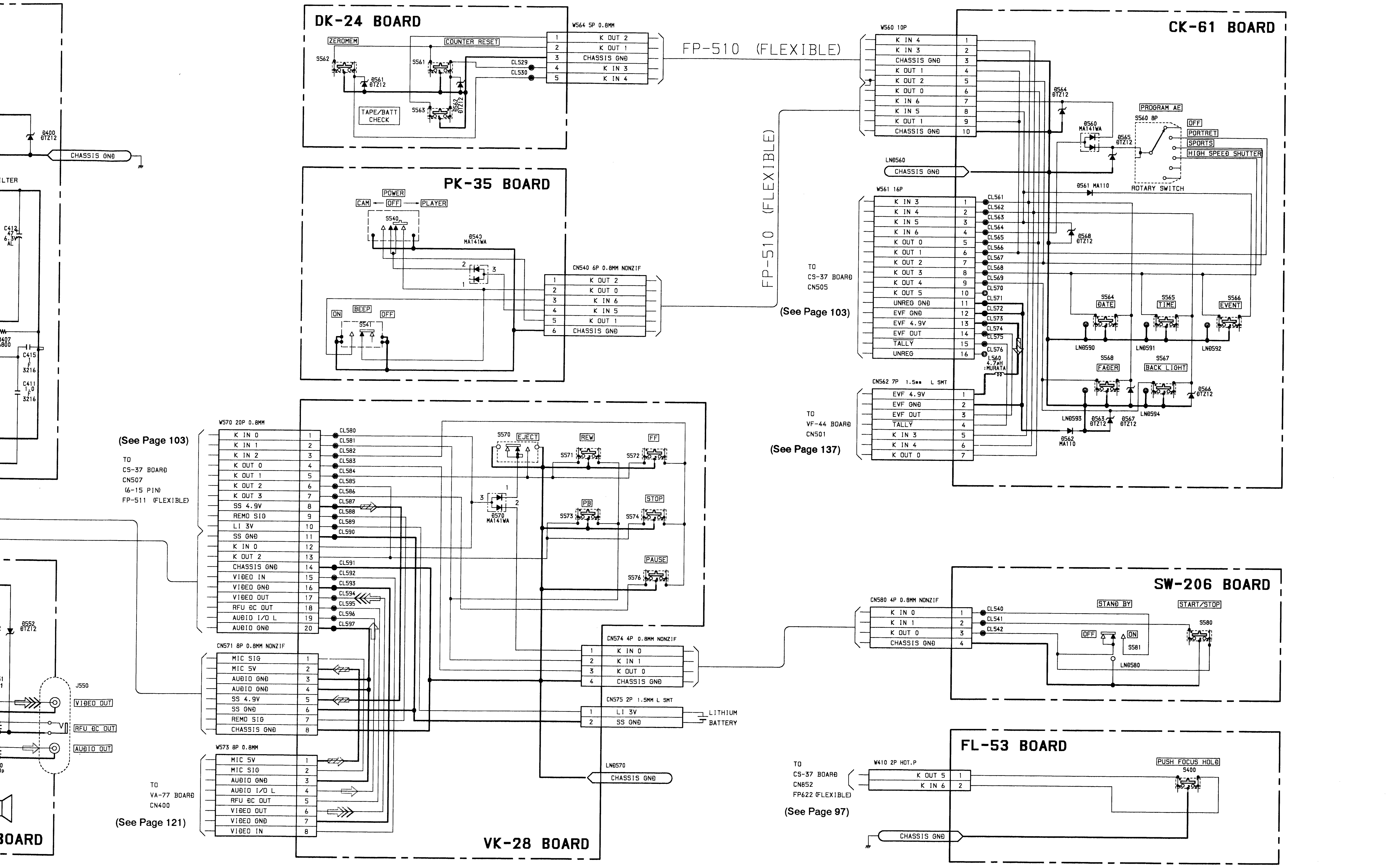
16
A
B
C
D
E
F
G
H
I
J
MA-155 BOARD
no mark : REC/PB mode
W400 0.8MM 8P
MIC SIG
MIC 5V
AUDIO GND
AUDIO GND
SS4.9V
SS GND
REMO SIG
SHASSIS GND
CHASSIS GND
Q400 LOW-CUT FILTER
MIC UNIT
MIC A
MIC B
CN400 4P L 1.5 SMT
MIC A GND
INT MIC A
INT MIC B
MIC B GND
MIC (PLUG IN POWER)
J400
IC400
LA7293M-TE-L MIC AMP
Q400 2SA1576
GND GUARD
DK-24 BOARD
ZEROMEM
COUNTER RESET
TAPE/BATT CHECK
S561
S562
S563
W564 5P 0.8MM
K OUT 2
K OUT 1
CHASSIS GND
K IN 3
K IN 4
FP-510 (FLEXIBLE)
PK-35 BOARD
POWER
CAM
OFF
PLAYER
S540
S541
BEEP
ON
OFF
CN540 6P 0.8MM NONZIF
K OUT 2
K OUT 0
K IN 6
K IN 5
K OUT 1
CHASSIS GND
TO CS-37 BOARD CN505
(See Page 103)
W570 20P 0.8MM
K IN 0
K IN 1
K IN 2
K OUT 0
K OUT 1
K OUT 2
K OUT 3
SS 4.9V
REMO SIG
LI 3V
SS GND
K IN 0
K OUT 2
CHASSIS GND
VIDEO IN
VIDEO GND
VIDEO OUT
RFU DC OUT
AUDIO I/O L
AUDIO GND
(See Page 103)
TO CS-37 BOARD CN507 (6-15 PIN) FP-511 (FLEXIBLE)
S570 EJECT
REW
FF
PB
STOP
PAUSE
S571
S572
S573
S574
S576
D570 MA141WA
CN571 8P 0.8MM NONZIF
MIC SIG
MIC 5V
AUDIO GND
AUDIO GND
SS 4.9V
SS GND
REMO SIG
CHASSIS GND
CN574 4P 0.8MM NONZIF
K IN 0
K IN 1
K OUT 0
CHASSIS GND
CN575 2P 1.5MM L SMT
LI 3V
SS GND
LITHIUM BATTERY
W573 8P 0.8MM
MIC 5V
MIC SIG
AUDIO GND
AUDIO I/O L
RFU DC OUT
VIDEO OUT
VIDEO GND
VIDEO IN
TO VA-77 BOARD CN400
(See Page 121)
LND570
CHASSIS GND
VK-28 BOARD
FP-511 (FLEXIBLE)
LND550
CHASSIS GND
CN550 12P 0.8MM
AUDIO GND
AUDIO IN/OUT L
RFU DC OUT
VIDEO OUT
VIDEO GND
VIDEO IN
CHASSIS GND
K OUT 2
K IN 0
SS GND
IN/OUT SW
BUZZER
TO CS-37 BOARD CN507 (1-5 PIN) FP-511 (FLEXIBLE)
(See Page 103)
J550
VIDEO OUT
RFU DC OUT
AUDIO OUT
S550 EDIT
OFF
ON
LP
REC MODE SP
BU550
PJ-50 BOARD
W560 10P
LND560
W561 16P
CN562 7P
TO VF-44 BOARD CN501
(See Page 137)
CN580 4P 0.8M
TO CS-37 BOARD CN852 FP622 (FLEXIBLE)
(See Page 97)
W410 2P HOT.
09

• SIGNAL PATH

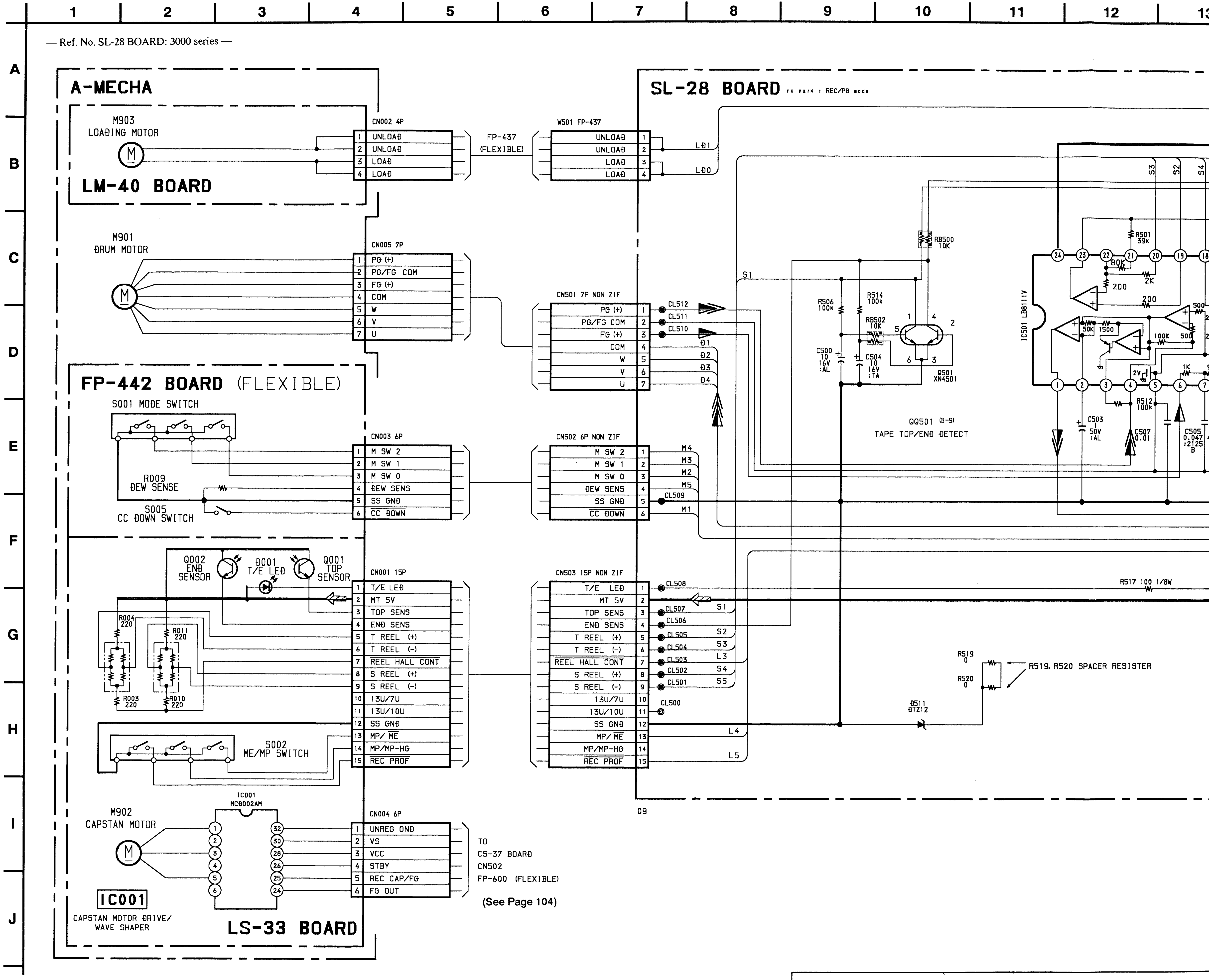
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡》	➡
PB			⇨》	⇨

6000 series, DK-24 BOARD: 7000 series, PK-35 BOARD: 8000 series, PJ-50 BOARD: 9000 series —


DK-24 BOARD
ZEROMEM
COUNTER RESET
S562
S561
S563
D561 DTZ12
D562 DTZ12
TAPE/BATT CHECK
CL529
CL530
W564 5P 0.8MM
1 K OUT 2
2 K OUT 1
3 CHASSIS GND
4 K IN 3
5 K IN 4
FP-510 (FLEXIBLE)
PK-35 BOARD
POWER
CAM
OFF
PLAYER
S540
D540 MA141WA
BEEP
ON
OFF
S541
CN540 6P 0.8MM NONZIF
1 K OUT 2
2 K OUT 0
3 K IN 6
4 K IN 5
5 K OUT 1
6 CHASSIS GND
D400 DTZ12
CHASSIS GND
C412 47 6.3V AL
C415 F 3216
C411 1.0 F 3216
D552 DTZ12
J550
VIDEO OUT
RFU DC OUT
AUDIO OUT
BOARD
CK-61 BOARD
W560 10P
1 K IN 4
2 K IN 3
3 CHASSIS GND
4 K OUT 1
5 K OUT 2
6 K OUT 0
7 K IN 6
8 K IN 5
9 K OUT 1
10 CHASSIS GND
D564 DTZ12
D560 MA141WA
D565 DTZ12
PROGRAM AE
S560 8P
OFF
PORTRET
SPORTS
HIGH SPEED SHUTTER
ROTARY SWITCH
LND560
CHASSIS GND
D561 MA110
W561 16P
1 K IN 3
2 K IN 4
3 K IN 5
4 K IN 6
5 K OUT 0
6 K OUT 1
7 K OUT 2
8 K OUT 3
9 K OUT 4
10 K OUT 5
11 UNREG GND
12 EVF GND
13 EVF 4.9V
14 EVF OUT
15 TALLY
16 UNREG
CL561 CL562 CL563 CL564 CL565 CL566 CL567 CL568 CL569 CL570 CL571 CL572 CL573 CL574 CL575 CL576
D568 DTZ12
L560 4.7μH :MURATA
TO CS-37 BOARD CN505
(See Page 103)
FP-510 (FLEXIBLE)
S564 DATE
S565 TIME
S566 EVENT
LND590
LND591
LND592
S568 FADER
S567 BACK LIGHT
D566 DTZ12
LND593
D563 DTZ12
D567 DTZ12
LND594
D562 MA110
CN562 7P 1.5mm L SMT
1 EVF 4.9V
2 EVF GND
3 EVF OUT
4 TALLY
5 K IN 3
6 K IN 4
7 K OUT 0
TO VF-44 BOARD CN501
(See Page 137)
VK-28 BOARD
W570 20P 0.8MM
1 K IN 0
2 K IN 1
3 K IN 2
4 K OUT 0
5 K OUT 1
6 K OUT 2
7 K OUT 3
8 SS 4.9V
9 REMO SIG
10 LI 3V
11 SS GND
12 K IN 0
13 K OUT 2
14 CHASSIS GND
15 VIDEO IN
16 VIDEO GND
17 VIDEO OUT
18 RFU DC OUT
19 AUDIO I/O L
20 AUDIO GND
CL580 CL581 CL582 CL583 CL584 CL585 CL586 CL587 CL588 CL589 CL590 CL591 CL592 CL593 CL594 CL595 CL596 CL597
(See Page 103)
TO CS-37 BOARD CN507 (6-15 PIN) FP-511 (FLEXIBLE)
S570 EJECT
REW
FF
S571
S572
D570 MA141WA
PB
STOP
S573
S574
PAUSE
S576
CN571 8P 0.8MM NONZIF
1 MIC SIG
2 MIC 5V
3 AUDIO GND
4 AUDIO GND
5 SS 4.9V
6 SS GND
7 REMO SIG
8 CHASSIS GND
W573 8P 0.8MM
1 MIC 5V
2 MIC SIG
3 AUDIO GND
4 AUDIO I/O L
5 RFU DC OUT
6 VIDEO OUT
7 VIDEO GND
8 VIDEO IN
TO VA-77 BOARD CN400
(See Page 121)
CN574 4P 0.8MM NONZIF
1 K IN 0
2 K IN 1
3 K OUT 0
4 CHASSIS GND
CN575 2P 1.5MM L SMT
1 LI 3V
2 SS GND
LITHIUM BATTERY
LND570
CHASSIS GND
SW-206 BOARD
CN580 4P 0.8MM NONZIF
1 K IN 0
2 K IN 1
3 K OUT 0
4 CHASSIS GND
CL540 CL541 CL542
STAND BY
START/STOP
S580
OFF
ON
S581
LND580
FL-53 BOARD
W410 2P HOT.P
1 K OUT 5
2 K IN 6
TO CS-37 BOARD CN852 FP622 (FLEXIBLE)
(See Page 97)
PUSH FOCUS HOLD
S400
CHASSIS GND

SL-28 (MECH CONTROL) SCHEMATIC DIAGRAM

— Ref. No. SL-28 BOARD: 3000 series —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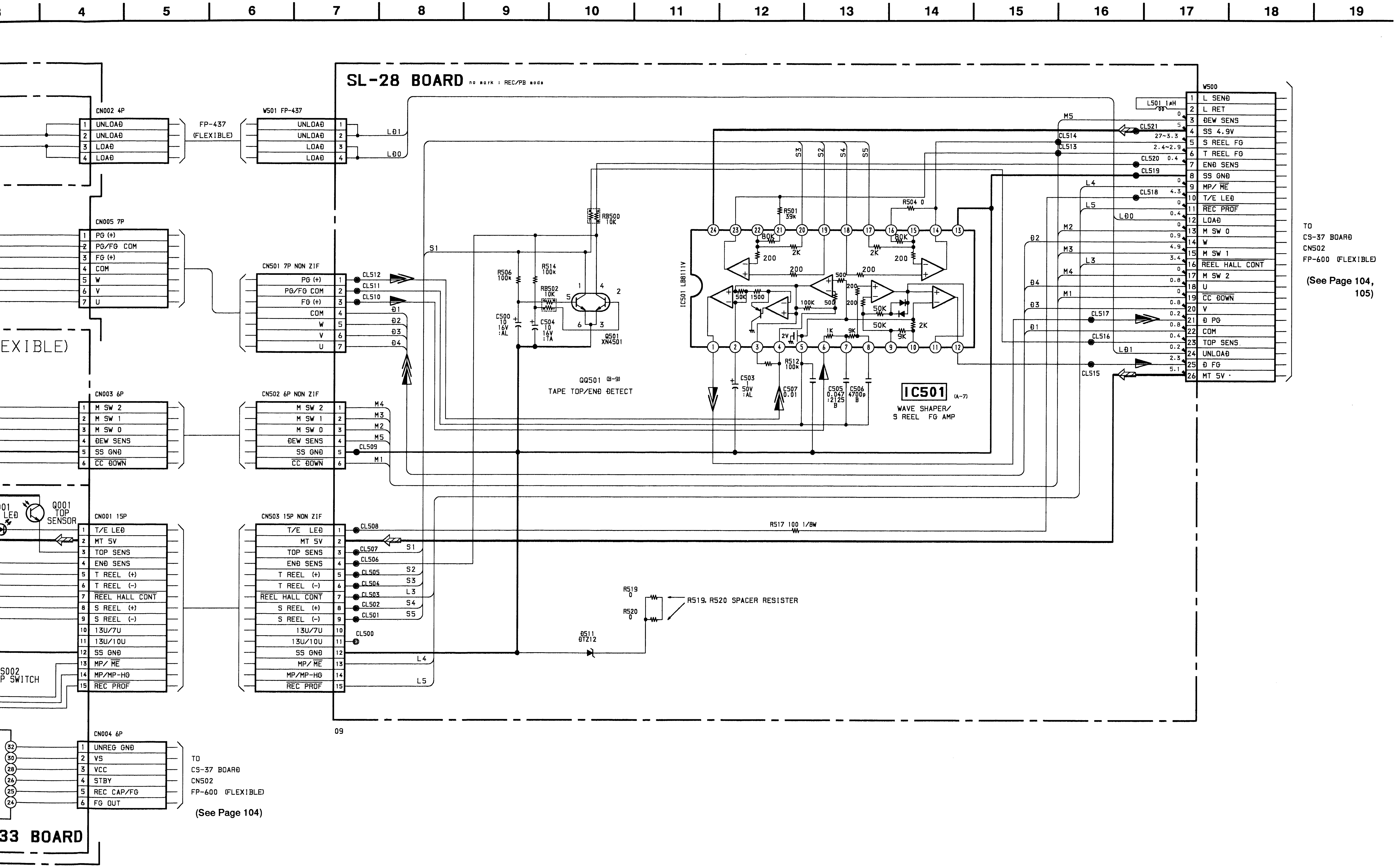
12
A
B
C
D
E
F
G
H
I
J
A-MECHA
M903
LOADING MOTOR
LM-40 BOARD
CN002 4P
1 UNLOAD
2 UNLOAD
3 LOAD
4 LOAD
FP-437
(FLEXIBLE)
W501 FP-437
UNLOAD 1
UNLOAD 2
LOAD 3
LOAD 4
LD1
LD0
SL-28 BOARD
no mark : REC/PB mode
M901
DRUM MOTOR
CN005 7P
1 PG (+)
2 PG/FG COM
3 FG (+)
4 COM
5 W
6 V
7 U
CN501 7P NON ZIF
PG (+) 1
PG/FG COM 2
FG (+) 3
COM 4
W 5
V 6
U 7
CL512
CL511
CL510
D1
D2
D3
D4
S1
S2
S3
S4
R506
100k
R514
100k
RB502
10K
RB500
10K
R501
39k
C500
10
16V
:AL
C504
10
16V
:TA
Q501
XN4501
QQ501 (B-9)
TAPE TOP/END DETECT
IC501 LB8111V
R512
100k
C503
1
50V
:AL
C507
0.01
C505
0.047
:2125
B
FP-442 BOARD (FLEXIBLE)
S001 MODE SWITCH
R009
DEW SENSE
S005
CC DOWN SWITCH
CN003 6P
1 M SW 2
2 M SW 1
3 M SW 0
4 DEW SENS
5 SS GND
6 CC DOWN
CN502 6P NON ZIF
M SW 2 1
M SW 1 2
M SW 0 3
DEW SENS 4
SS GND 5
CC DOWN 6
M4
M3
M2
M5
CL509
M1
Q002
END
SENSOR
D001
T/E LED
Q001
TOP
SENSOR
R004
220
R011
220
R003
220
R010
220
CN001 15P
1 T/E LED
2 MT 5V
3 TOP SENS
4 END SENS
5 T REEL (+)
6 T REEL (-)
7 REEL HALL CONT
8 S REEL (+)
9 S REEL (-)
10 13U/7U
11 13U/10U
12 SS GND
13 MP/ ME
14 MP/MP-HG
15 REC PROF
CN503 15P NON ZIF
T/E LED 1
MT 5V 2
TOP SENS 3
END SENS 4
T REEL (+) 5
T REEL (-) 6
REEL HALL CONT 7
S REEL (+) 8
S REEL (-) 9
13U/7U 10
13U/10U 11
SS GND 12
MP/ ME 13
MP/MP-HG 14
REC PROF 15
CL508
CL507
CL506
CL505
CL504
CL503
CL502
CL501
CL500
L3
L4
L5
R517 100 1/8W
R519
0
R520
0
R519, R520 SPACER RESISTER
D511
DTZ12
S002
ME/MP SWITCH
M902
CAPSTAN MOTOR
IC001
MCD002AM
IC001
CAPSTAN MOTOR DRIVE/
WAVE SHAPER
LS-33 BOARD
CN004 6P
1 UNREG GND
2 VS
3 VCC
4 STBY
5 REC CAP/FG
6 FG OUT
TO
CS-37 BOARD
CN502
FP-600 (FLEXIBLE)
(See Page 104)
09

- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷>	
Drum servo (speed and phase)		▷>>	
Capstan speed servo			
Capstan phase servo	➤》	➤》》	⊃》
Capstan servo (speed and phase)		➤》	
Ref. signal			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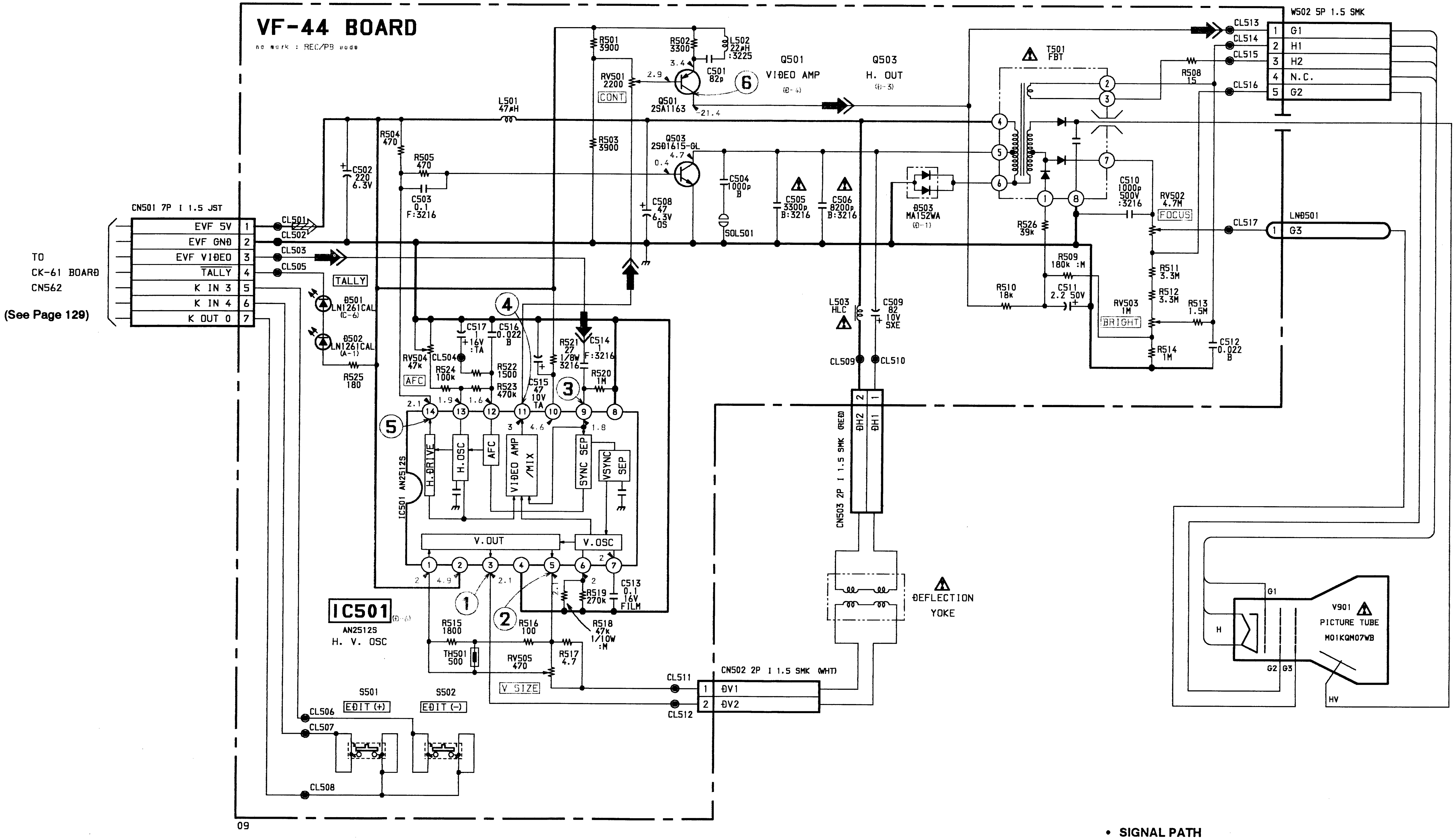
19
SL-28 BOARD
no mark : REC/PB mode
CN002 4P
UNLOAD
UNLOAD
LOAD
LOAD
FP-437 (FLEXIBLE)
W501 FP-437
LD1
LD0
CN005 7P
PG (+)
PG/FG COM
FG (+)
COM
W
V
U
CN501 7P NON ZIF
CL512
CL511
CL510
EXIBLE)
CN003 6P
M SW 2
M SW 1
M SW 0
DEW SENS
SS GND
CC DOWN
CN502 6P NON ZIF
CL509
Q001 TOP SENSOR
LED
CN001 15P
T/E LED
MT 5V
TOP SENS
END SENS
T REEL (+)
T REEL (-)
REEL HALL CONT
S REEL (+)
S REEL (-)
13U/7U
13U/10U
SS GND
MP/ME
MP/MP-HG
REC PROF
S002
P SWITCH
CN503 15P NON ZIF
CL508
CL507
CL506
CL505
CL504
CL503
CL502
CL501
CL500
CN004 6P
UNREG GND
VS
VCC
STBY
REC CAP/FG
FG OUT
TO CS-37 BOARD CN502 FP-600 (FLEXIBLE)
(See Page 104)
33 BOARD
09
RB500 10K
R514 100k
R506 100k
RB502 10K
C500 10 16V :AL
C504 10 16V :TA
Q501 XN4501
QQ501 (B-9)
TAPE TOP/END DETECT
IC501 LB8111V
R501 39k
R504 0
80K
200
2K
500
1500
100K
50K
9K
1K
2V
R512 100k
C503 1 50V :AL
C507 0.01
C505 0.047 :2125 B
C506 4700p B
IC501 (A-7)
WAVE SHAPER/ S REEL FG AMP
R517 100 1/8W
R519 0
R520 0
R519, R520 SPACER RESISTER
D511 DTZ12
L501 1μH
CL521
CL514
CL513
CL520
CL519
CL518
CL517
CL516
CL515
W500
L SEND
L RET
DEW SENS
SS 4.9V
S REEL FG
T REEL FG
END SENS
SS GND
MP/ME
T/E LED
REC PROF
LOAD
M SW 0
W
M SW 1
REEL HALL CONT
M SW 2
U
CC DOWN
V
D PG
COM
TOP SENS
UNLOAD
D FG
MT 5V
TO CS-37 BOARD CN502 FP-600 (FLEXIBLE)
(See Page 104, 105)

MECHANISM CONTROL MECHANISM CONTROL

VF-44 (VIEW FINDER) SCHEMATIC DIAGRAM

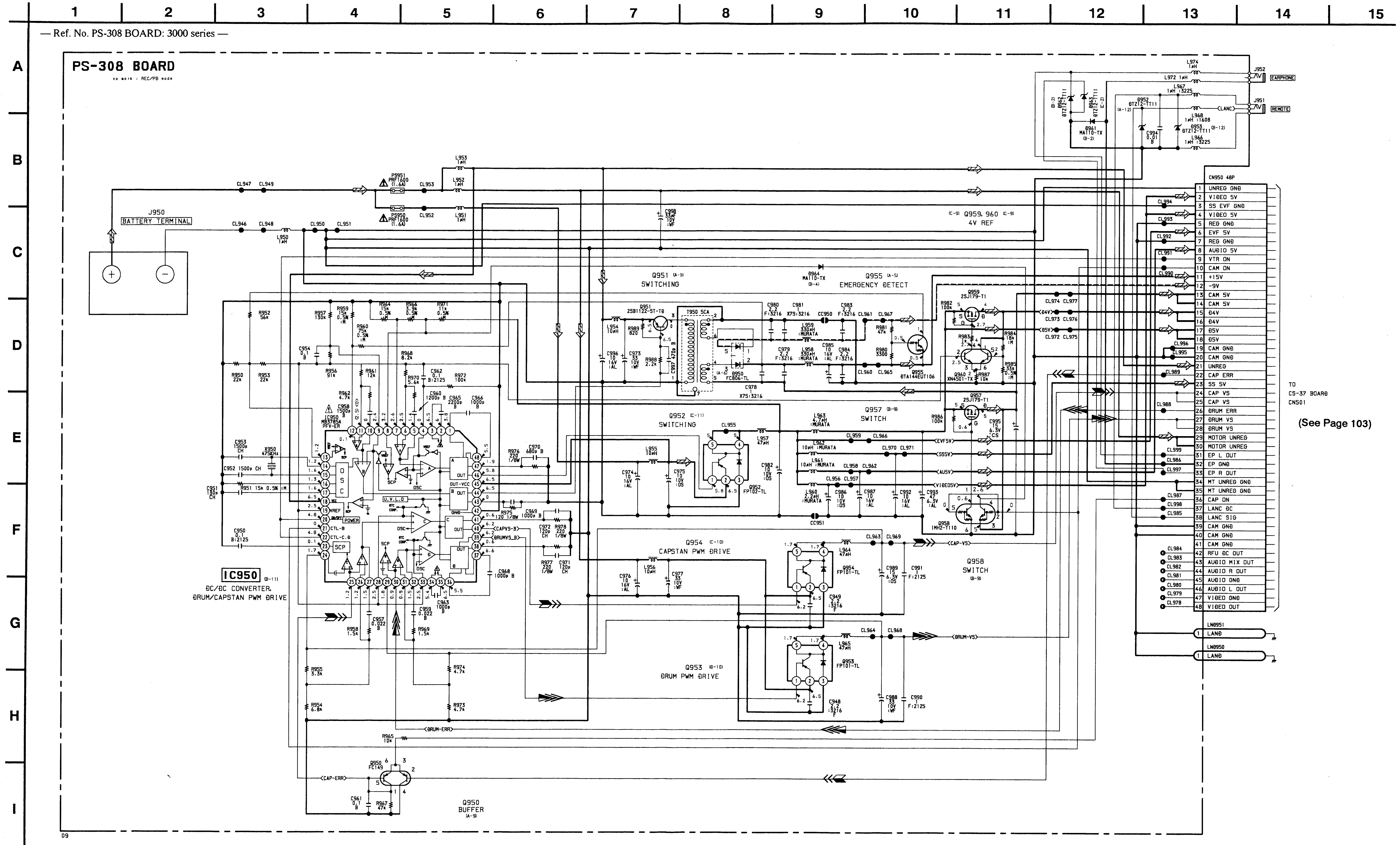
— Ref. No. VF-44 BOARD: 2000 series —


VF-44 BOARD
no mark : REC/PB mode
CN501 7P I 1.5 JST
EVF 5V 1
EVF GND 2
EVF VIDEO 3
TALLY 4
K IN 3 5
K IN 4 6
K OUT 0 7
TO CK-61 BOARD CN562
(See Page 129)
Q501 VIDEO AMP
Q503 H. OUT
Q501 2SA1163
Q503 2SD1615-GL
RV501 2200 CONT
L501 47μH
D501 LN1261CAL
D502 LN1261CAL
R525 180
TALLY
IC501 AN2512S H. V. OSC
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V.OUT
V.OSC
RV504 47k AFC
RV505 470 V SIZE
TH501 500
S501 EDIT (+)
S502 EDIT (−)
CL506
CL507
CL508
CL511
CL512
CN502 2P I 1.5 SMK (WHT)
DV1
DV2
L503 HLC
C509 82 10V SXE
CL509
CL510
CN503 2P I 1.5 SMK (RED)
DH2
DH1
DEFLECTION YOKE
D503 MA152WA
T501 FBT
RV502 4.7M FOCUS
RV503 1M BRIGHT
W502 5P 1.5 SMK
G1
H1
H2
N.C.
G2
CL513
CL514
CL515
CL516
CL517
LND501
G3
V901 PICTURE TUBE M01KQN07WB
HV
09

• SIGNAL PATH

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC		➡		
PB				

PS-308 (POWER/MECH DRIVE) SCHEMATIC DIAGRAM


— Ref. No. PS-308 BOARD: 3000 series —

PS-308 BOARD
J950 BATTERY TERMINAL
IC950 DC/DC CONVERTER, DRUM/CAPSTAN PWM DRIVE
IC950 MB3785A PFV-ER
Q951 SWITCHING
Q955 EMERGENCY DETECT
Q959, 960 4V REF
Q952 SWITCHING
Q957 SWITCH
Q954 CAPSTAN PWM DRIVE
Q953 DRUM PWM DRIVE
Q958 SWITCH
Q950 BUFFER
T950 SCA
J952 EARPHONE
J951 REMOTE
CN950 48P
1 UNREG GND
2 VIDEO 5V
3 SS EVF GND
4 VIDEO 5V
5 REG GND
6 EVF 5V
7 REG GND
8 AUDIO 5V
9 VTR ON
10 CAM ON
11 +15V
12 -9V
13 CAM 5V
14 CAM 5V
15 D4V
16 D4V
17 D5V
18 D5V
19 CAM GND
20 CAM GND
21 UNREG
22 CAP ERR
23 SS 5V
24 CAP VS
25 CAP VS
26 DRUM ERR
27 DRUM VS
28 DRUM VS
29 MOTOR UNREG
30 MOTOR UNREG
31 EP L OUT
32 EP GND
33 EP R OUT
34 MT UNREG GND
35 MT UNREG GND
36 CAP ON
37 LANC DC
38 LANC SIG
39 CAM GND
40 CAM GND
41 CAM GND
42 RFU DC OUT
43 AUDIO MIX OUT
44 AUDIO R OUT
45 AUDIO GND
46 AUDIO L OUT
47 VIDEO GND
48 VIDEO OUT
LND951 1 LAND
LND950 1 LAND
TO CS-37 BOARD CN501
(See Page 103)

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡≫	➡
PB			⇨≫	⇨

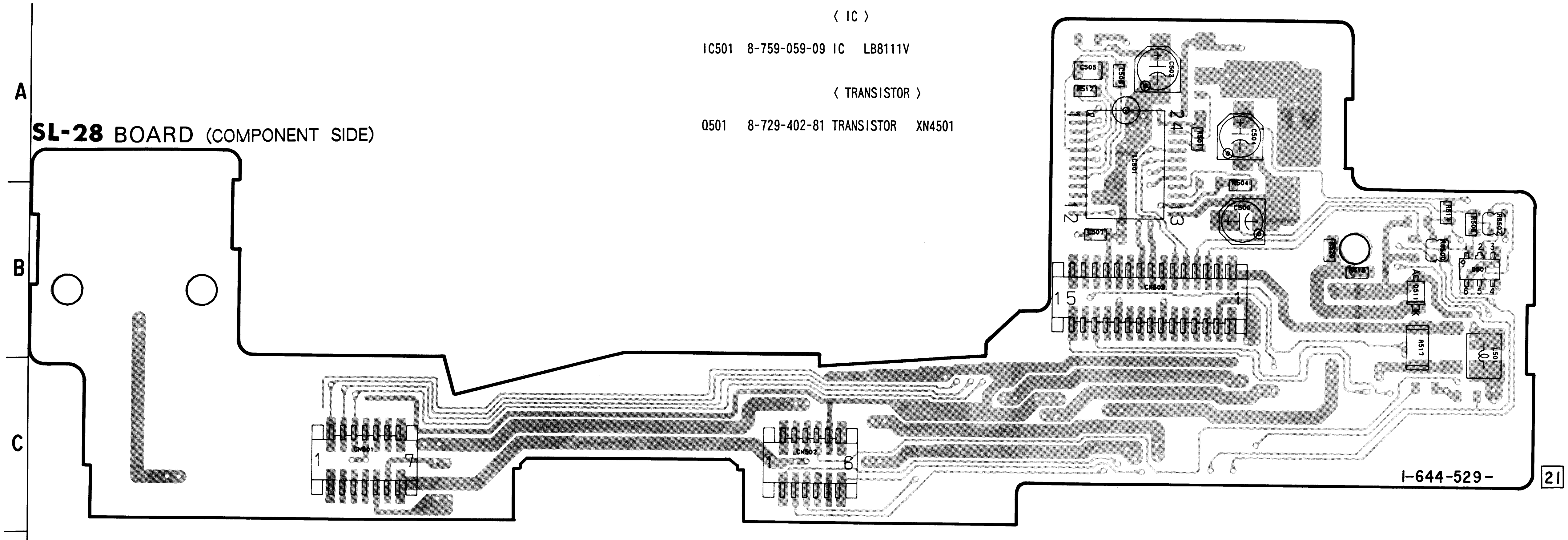
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷>	
Drum servo (speed and phase)		▷≫	
Capstan phase servo	➡›	⇨›	⇨›
Capstan servo (speed and phase)		⇨≫	

SL-28 (MECH CONTROL) PRINTED WIRING BOARD

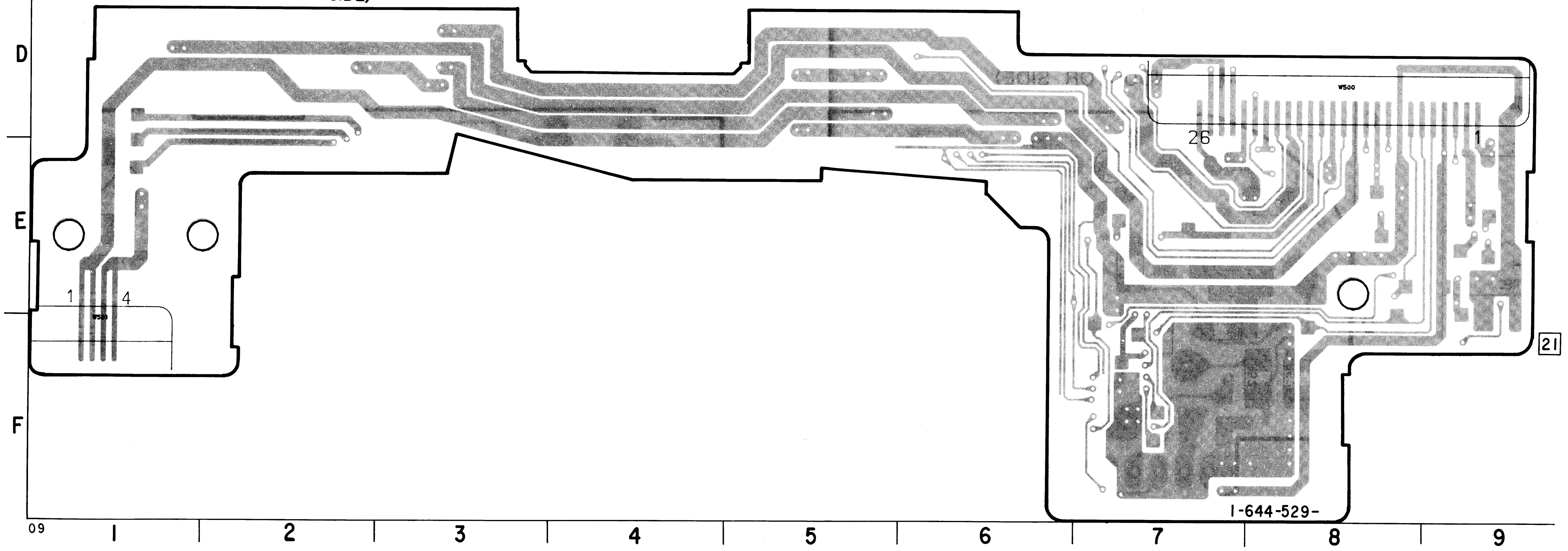
— Ref. No. SL-28 BOARD: 3000 series —

	(DIODE)		
D511	8-719-110-03	DIODE	RD7.5ES-B2
	(IC)		
IC501	8-759-059-09	IC	LB8111V
	(TRANSISTOR)		
Q501	8-729-402-81	TRANSISTOR	XN4501

SL-28 BOARD (COMPONENT SIDE)


A
B
C
C505
C506
C503
R512
IC501
1
24
12
13
R501
C504
R504
C500
C507
CN503
15
1
R520
R516
R514
R506
RB502
RB500
Q501
1
2
3
6
5
4
A
D511
K
R517
L501
CN501
1
7
CN502
1
6
1-644-529-
21

SL-28 BOARD (CONDUCTOR SIDE)


D
E
F
W500
26
1
1
4
W501
1-644-529-
21
09
1
2
3
4
5
6
7
8
9

VF-44 (VIEW FINDER) PRINTED WIRING BOARD

— Ref. No. VF-44 BOARD: 2000 series —

(DIODE)

D501	8-719-024-87	DIODE	LN1261CAL
D502	8-719-024-87	DIODE	LN1261CAL
D503	8-719-400-20	DIODE	MA152WA

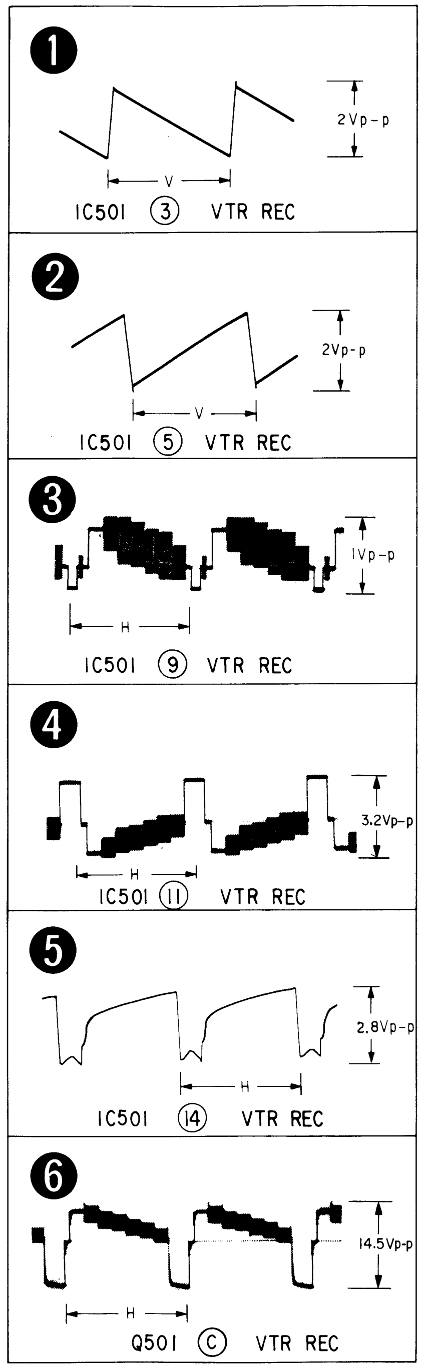
(IC)

IC501	8-759-420-01	IC	AN2512S

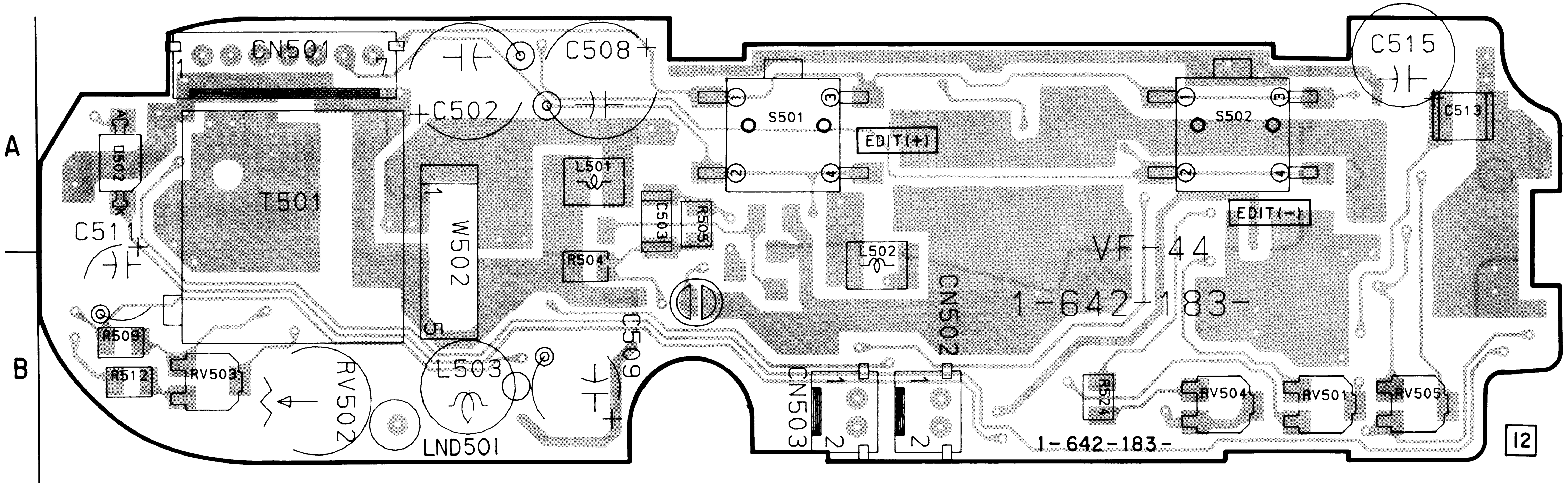
(TRANSISTOR)

Q501	8-729-216-31	TRANSISTOR	2SA1163-G
Q503	8-729-106-68	TRANSISTOR	2SD1615A-GP

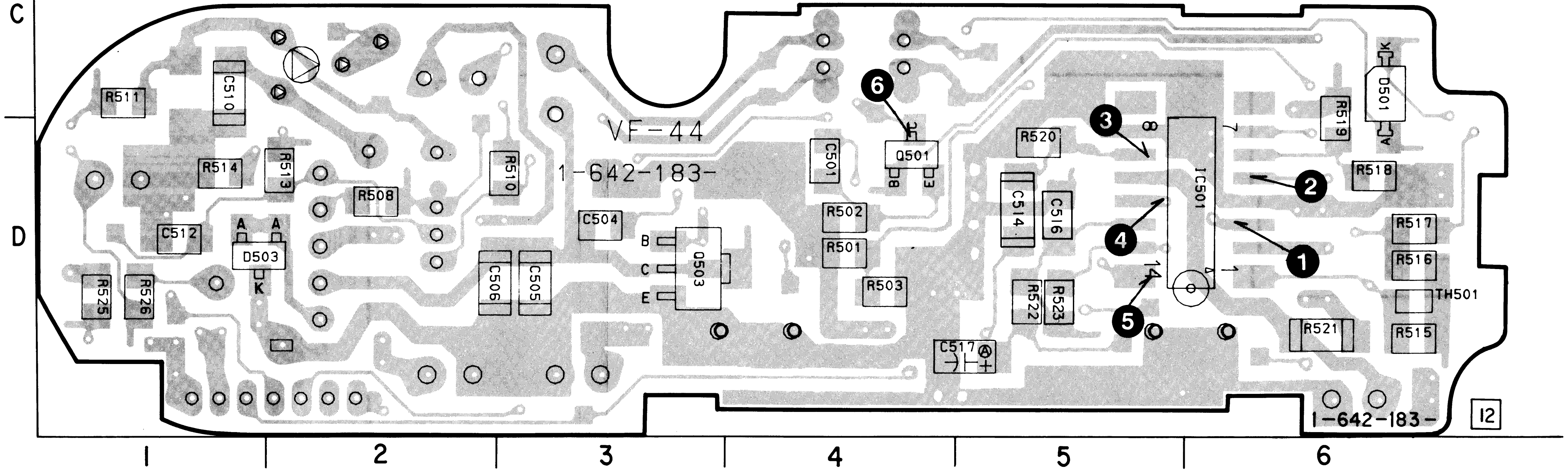
VF-44 BOARD



VF-44 (COMPONENT SIDE)


A
B
CN501
1
7
C502
C508
C515
C513
D502
T501
W502
C511
R509
R512
RV503
RV502
L503
LND501
C509
L501
C503
R505
R504
S501
EDIT(+)
L502
CN502
CN503
S502
EDIT(−)
VF-44
1-642-183-
R524
RV504
RV501
RV505
12

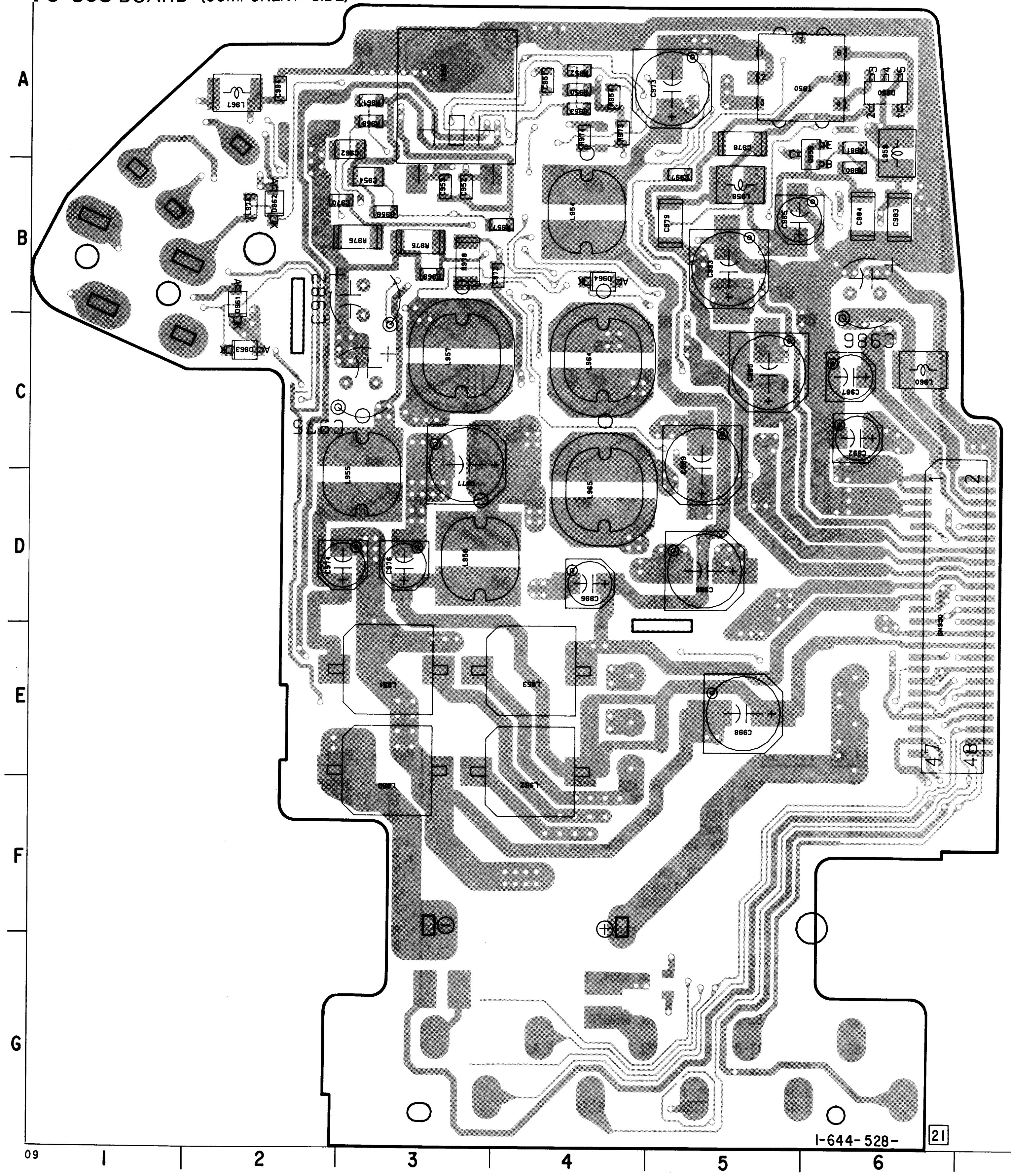
VF-44 (CONDUCTOR SIDE)


C
D
R511
C510
R514
R513
R508
C512
D503
A
K
R525
R526
C506
C505
R510
VF-44
1-642-183-
C504
Q503
B
C
E
C501
Q501
R502
R501
R503
C517
R520
C514
C516
R522
R523
IC501
8
7
14
1
R519
D501
R518
R517
R516
TH501
R521
R515
❶
❷
❸
❹
❺
❻
1-642-183-
12
1
2
3
4
5
6

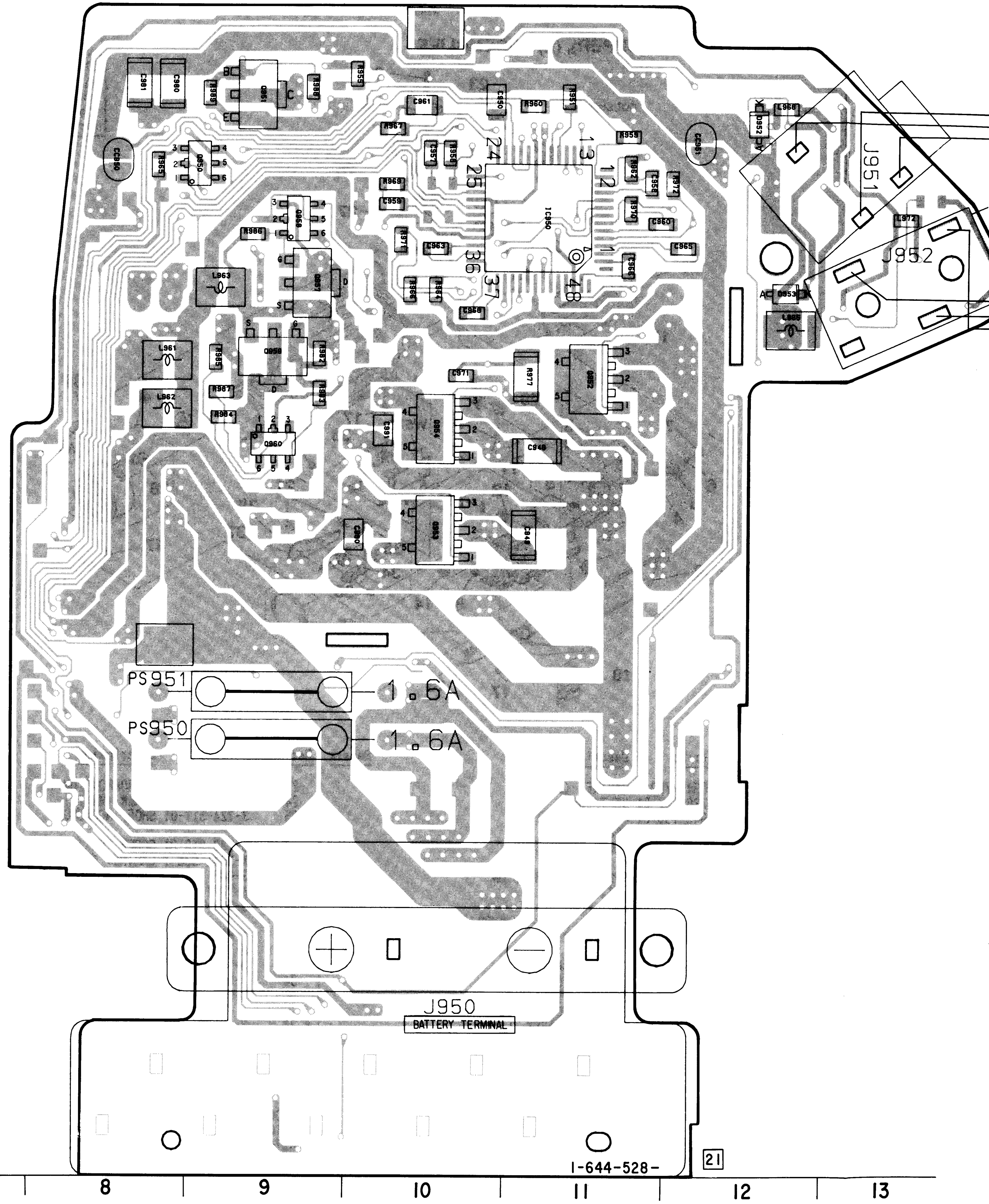
PS-308 (POWER/MECH DRIVE) PRINTED WIRING BOARD

— Ref. No. PS-308 BOARD: 3000 series —

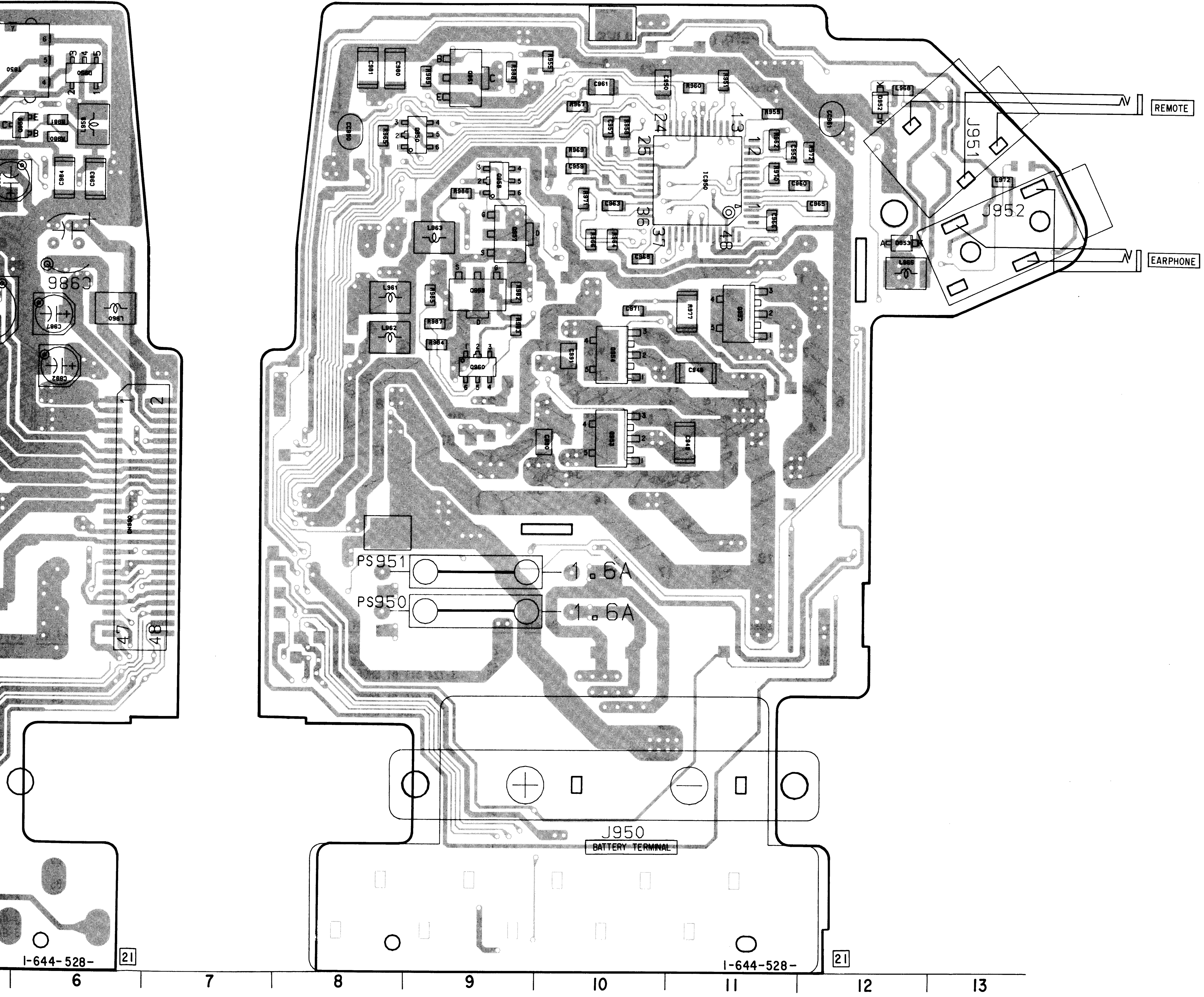
PS-308 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
1
2
3
4
5
6
L967
L957
L964
L955
L965
L956
L954
L953
L951
L950
L952
C973
C988
C986
C982
C975
CN950
1
2
47
48
1-644-528-
21

PS-308 BOARD (CONDUCTOR SIDE)


7
8
9
10
11
12
13
J951
J952
IC950
24
25
13
12
1
36
37
48
PS951
1.6A
PS950
1.6A
J950
BATTERY TERMINAL
1-644-528-
21

PS-308 BOARD (CONDUCTOR SIDE)


REMOTE
EARPHONE
J951
J952
IC950
PS951
1.6A
PS950
1.6A
J950
BATTERY TERMINAL
1-644-528-
21
1-644-528-
21
6
7
8
9
10
11
12
13

(DIODE)

D950	8-719-989-33	DIODE	FC806
D952	8-719-110-03	DIODE	RD7. 5ES-B2
D953	8-719-110-03	DIODE	RD7. 5ES-B2
D961	8-719-404-46	DIODE	MA110
D962	8-719-110-03	DIODE	RD7. 5ES-B2
D963	8-719-110-03	DIODE	RD7. 5ES-B2
D964	8-719-404-46	DIODE	MA110

(IC)

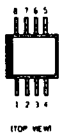
⚠IC950	8-759-060-94	IC	MB3785APFV-G-BND-ER

(TRANSISTOR)

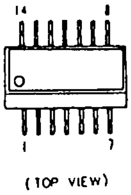
Q950	8-729-823-95	TRANSISTOR	FC149
Q951	8-729-804-41	TRANSISTOR	2SB1122-S
Q952	8-729-823-84	TRANSISTOR	FP102
Q953	8-729-823-82	TRANSISTOR	FP101
Q954	8-729-823-82	TRANSISTOR	FP101
Q955	8-729-905-12	TRANSISTOR	DTA144EU
Q957	8-729-011-26	TRANSISTOR	2SJ179
Q958	8-729-920-48	TRANSISTOR	IMH2
Q959	8-729-011-26	TRANSISTOR	2SJ179
Q960	8-729-402-81	TRANSISTOR	XN4501

4-3. SEMICONDUCTORS

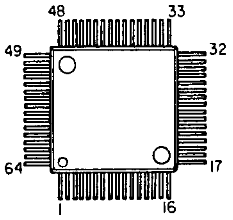
AK6420F
LM358D


8 7 6 5
1 2 3 4
(TOP VIEW)

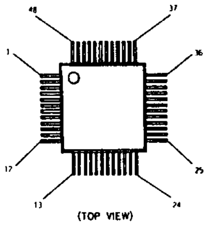
AN2512S


14
8
1
7
(TOP VIEW)

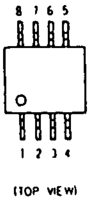
CXA1207AR
CXD1257AR


48
33
49
32
64
17
1
16

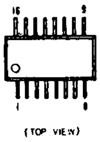
CXA1208R
CXA-1488R
CXA1507BR
TB1206F-EL


48
37
1
36
17
25
13
24
(TOP VIEW)

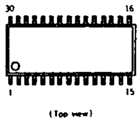
CXA1211M
LA7293M
RC3414M


8 7 6 5
1 2 3 4
(TOP VIEW)

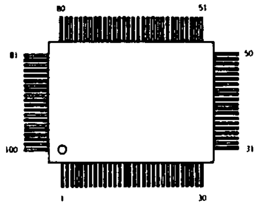
CXA1448N
CXA1452
CXL1506M
M62353GP
μPD6456GS-618-E2


16
9
1
8
(TOP VIEW)

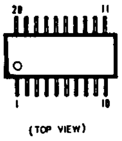
CXA8006M


30
16
1
15
(Top view)

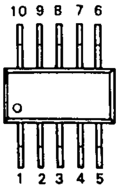
CXD2100AQ
CXP80624-299Q/410Q


80
51
81
50
100
31
1
30

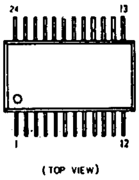
CXD2104N
M62352GP
MPC1720M
MPC1724M
μPD7564G-540


20
11
1
10
(TOP VIEW)

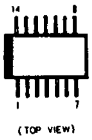
LB1830M


10 9 8 7 6
1 2 3 4 5

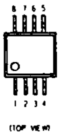
LB8111V


24
13
1
12
(TOP VIEW)

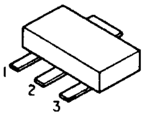
LM324D


14
8
1
7
(TOP VIEW)

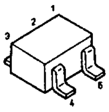
NJM2235M


8 7 6 5
1 2 3 4
(TOP VIEW)

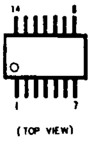
S-81350HG-KD



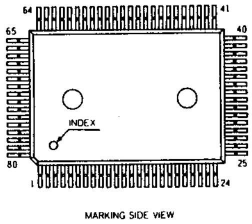
SC7S04F
TC4S66F



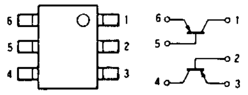
TL1596CDB


14
8
1
7
(TOP VIEW)

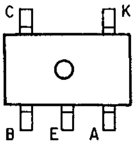
μPD75316GF-303-3B9


64
41
65
40
INDEX
80
25
1
24
MARKING SIDE VIEW

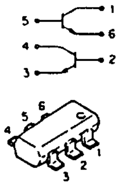
FC149
IMT2
XN4401


6
5
4
1
2
3
6
1
5
2
4
3

FP101
FP102



IMH2
XN4215
XN4501


5
1
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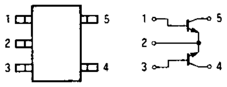
3

XN1501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2
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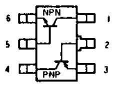
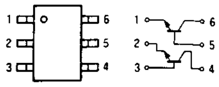
4

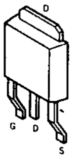
XN4312
XN4601


NPN
PNP
6
5
4
1
2
3

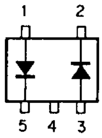
XN6401


1
2
3
6
5
4
1
2
3
6
5
4

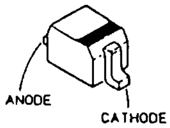
2SJ179



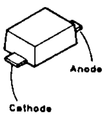
FC806-TL



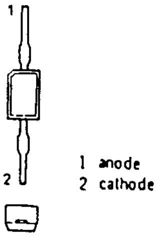
MA110


ANODE
CATHODE

MA728


Anode
Cathode

LN1261CAL


1
2
1 anode
2 cathode

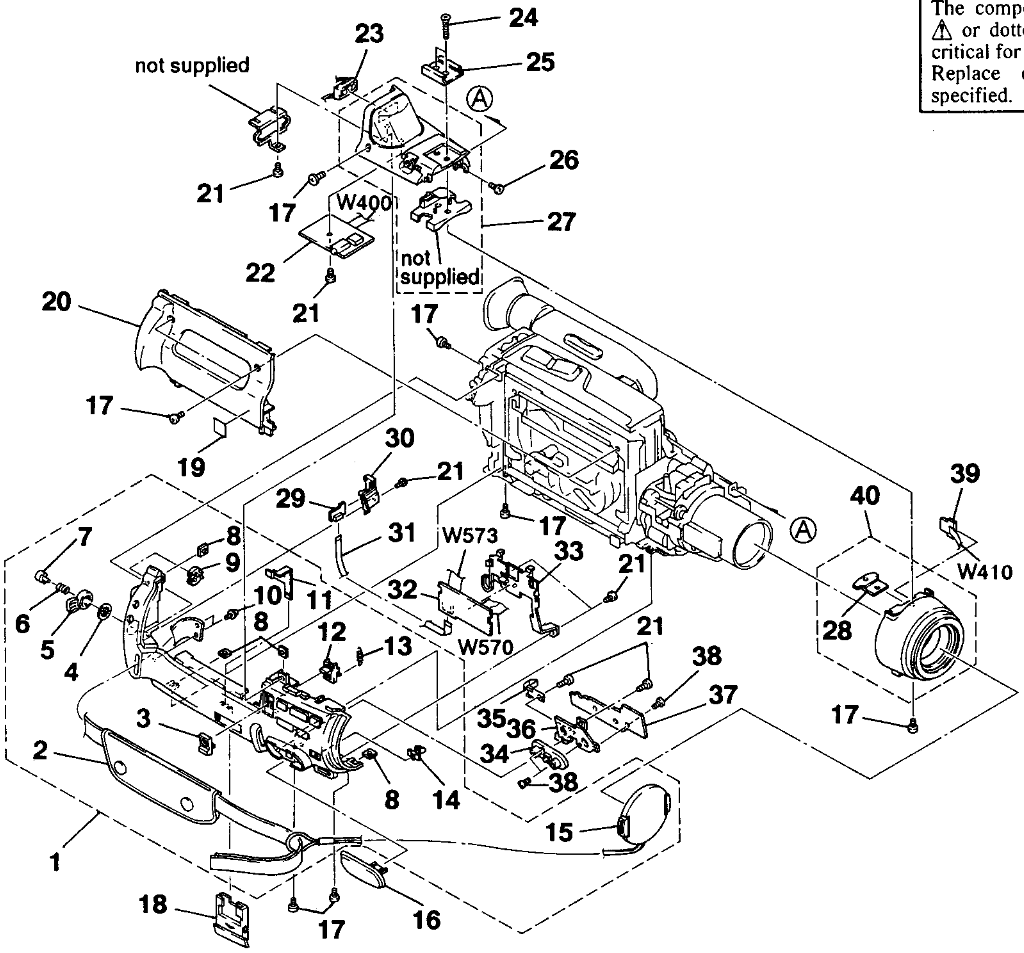
SECTION 5
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

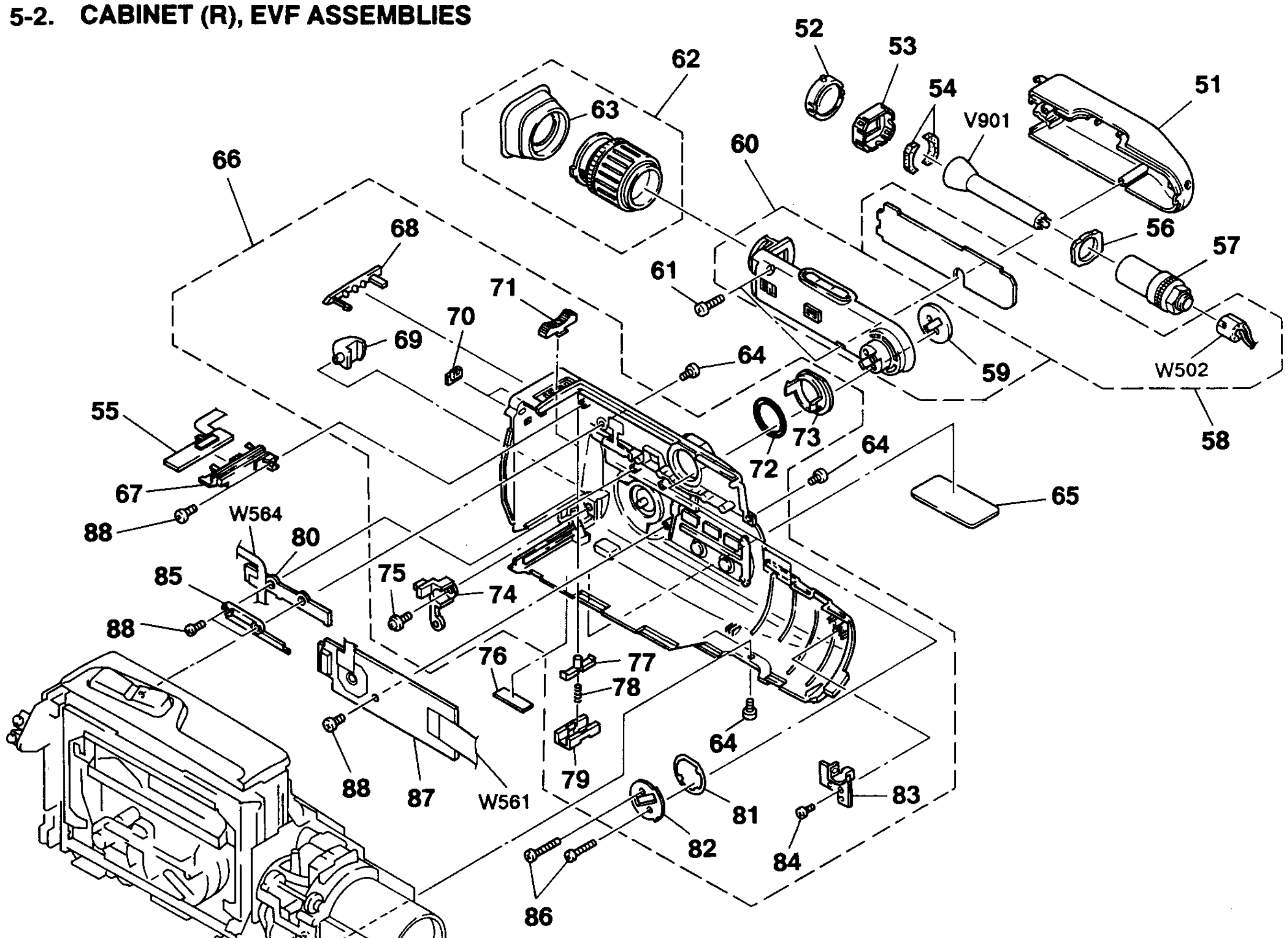
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (UPPER), (L) ASSEMBLIES



Ref. No.	Part No.	Description	Remark
1	X-3941-789-1	CABINET (L) ASSY	
2	3-736-807-01	BELT, GRIP	
3	3-946-195-01	BUTTON, EJECT	
4	3-736-364-01	SPRING	
5	3-942-985-01	KNOB, STAND-BY	
6	3-578-221-00	SPRING, COMPRESSION	
7	3-736-343-01	BUTTON, S/S	
8	3-718-233-01	NUT, PLATE	
9	3-946-260-01	HOLDER, STAND-BY KNOB	
10	3-669-480-21	+ PTPWH 2	
11	1-550-743-11	HOLDER, BATTERY	
12	3-946-194-01	LOCK, EJECT	
13	3-570-896-00	SPRING, TENSION	
14	3-946-187-01	BUTTON, EDIT	
15	A-7091-784-A	CAP BLOCK ASSY, LENS	
16	3-946-169-01	LID, JACK	
17	3-719-381-01	SCREW (M2X4)	
18	X-3941-541-1	HOLDER ASSY, LITHIUM	
* 19	3-703-713-41	STICKER, SONY SYMBOL (10)	
20	X-3941-938-1	LID ASSY, CASSETTE	
21	3-948-339-01	SCREW (BTP) (2X5), HEAD	
22	A-7063-309-A	MA-155P BOARD, COMPLETE	
23	1-542-126-41	MICROPHONE UNIT	
24	3-948-809-31	SCREW (M2X12)	
25	3-724-511-01	SHOE, ACCESSORY	
26	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
27	X-3941-936-1	CABINET (UPPER) ASSY	
28	3-946-172-01	SHEET METAL, SHOE	
29	A-7071-685-A	SW-206P BOARD, COMPLETE	
30	3-946-185-01	HOLDER, SW	
31	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
32	A-7071-684-A	VK-28P BOARD, COMPLETE	
33	3-946-259-01	HOLDER, VK	
34	1-537-402-11	TERMINAL BOARD	
35	3-947-487-01	PLATE, GROUND, PJ	
* 36	3-946-225-01	REINFORCEMENT, PJ	
37	A-7071-686-A	PJ-50P BOARD, COMPLETE	
38	3-724-455-01	SCREW (M2X4)	
39	A-7071-690-A	FL-53P BOARD, COMPLETE	
40	X-3941-943-1	CABINET (FRONT) ASSY	
W400	1-690-603-11	CABLE, FLAT (FCC-25) 8P	
W410	1-645-261-11	FP-622 FLEXIBLE BOARD	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
W573	1-690-606-11	CABLE, FLAT (FCC-32) 8P	

5-2. CABINET (R), EVF ASSEMBLIES

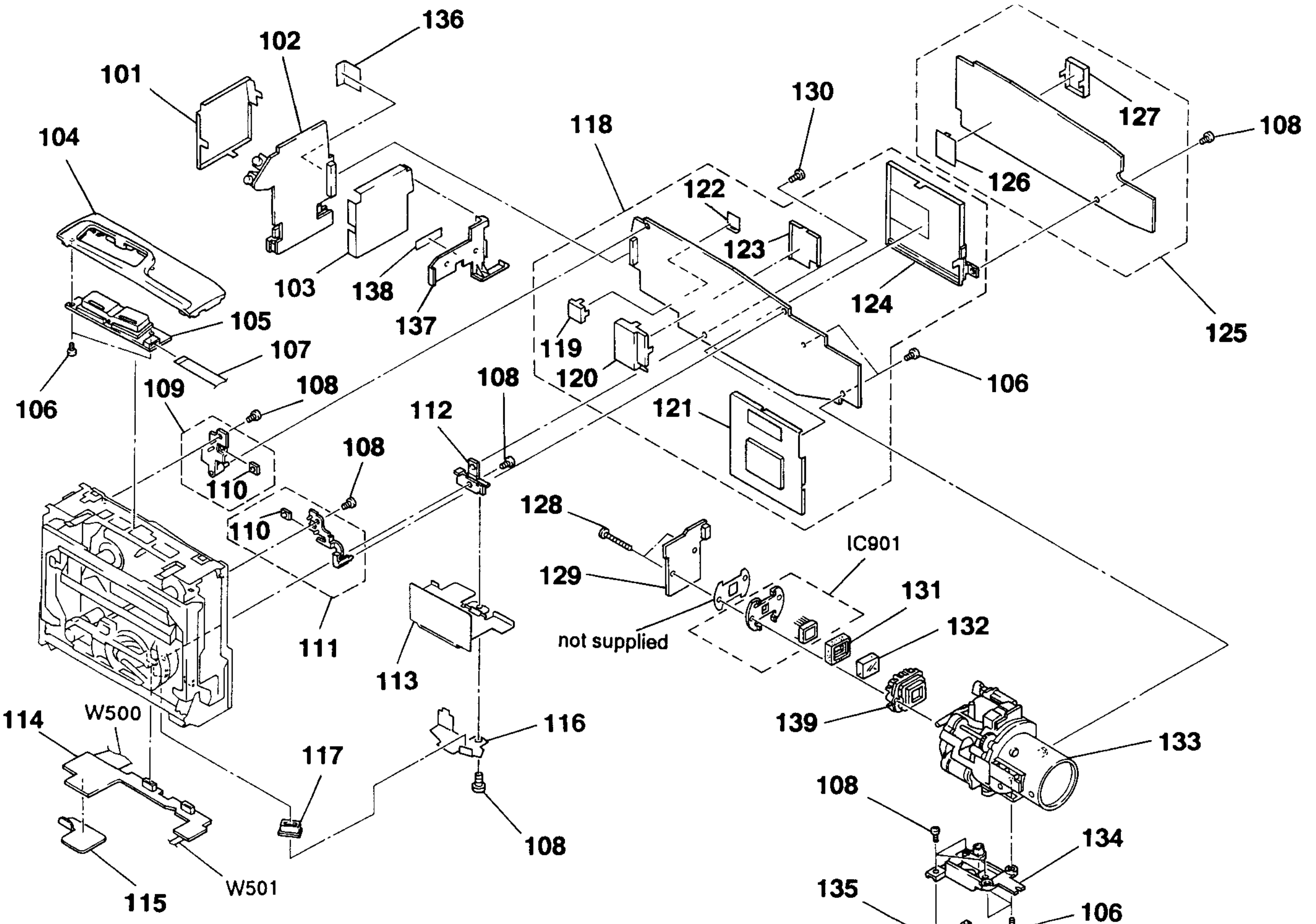


The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	X-3942-123-1	CABINET (R) ASSY, EVF	
52	A-7081-905-A	LENS ASSY, VF	
53	3-946-203-01	HOLDER, CRT	
54	3-946-205-01	PACKING, CRT	
55	A-7071-689-A	PK-35P BOARD, COMPLETE	
56	3-946-204-01	COVER, CRT	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
58	A-7063-129-A	VF-44P BOARD, COMPLETE	
59	3-946-202-01	JOINT, EVF	
60	X-3941-318-1	CABINET (L) ASSY, EVF	
61	3-713-790-31	SCREW (M2X8), TAPPING, P3	
62	A-7081-897-A	HOLDER BLOCK ASSY, FINDER	
63	3-946-212-01	EYE CUP	
64	3-719-381-01	SCREW (M2X4)	
* 65	3-949-152-01	LABEL, MODEL NUMBER (AEP)	
* 65	3-949-711-01	LABEL, MODEL NUMBER (UK, E, Australian)	
66	X-3941-937-1	CABINET (R) ASSY	
67	3-946-198-01	RETAINER, PK	
68	3-946-256-01	CAP, POWER	
69	3-946-246-01	BUTTON, BATTERY RELEASE	
70	3-946-251-01	BUTTON, ON/OFF	
71	3-946-248-01	BUTTON, POWER	

Ref. No.	Part No.	Description	Remark
72	3-946-253-01	RING, TILT	
73	3-946-252-01	SLEEVE, EVF	
74	3-946-250-01	CLAW, BATTERY LOCK	
75	3-669-480-21	+ PTPWH 2	
* 76	3-704-235-01	LABEL, CAUTION (UK)	
77	3-946-186-01	PUSH BUTTON, POWER	
78	3-303-973-00	SPRING, COMPRESSION	
79	3-946-249-01	PLATE, FUNCTION, POWER	
80	1-644-533-21	DK-24P BOARD	
81	3-946-255-01	SPRING, LEAF, TILT	
82	3-946-254-01	PLATE, LOCK, TILT	
83	3-947-315-01	PLATE, FIXED, CABINET	
84	3-713-790-01	SCREW (M2X5), TAPPING, P3	
85	3-946-199-01	RETAINER, DK	
86	3-740-546-51	SCREW (M2X9)	
87	A-7071-687-A	CK-61P BOARD, COMPLETE	
88	3-948-339-01	SCREW (BTP) (2X5), HEAD	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
⚠W502	1-540-019-51	SOCKET ASSY, CRT	
W561	1-690-602-11	CABLE, FLAT (FCC-23) 16P	
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

5-3. MAIN BOARD ASSEMBLY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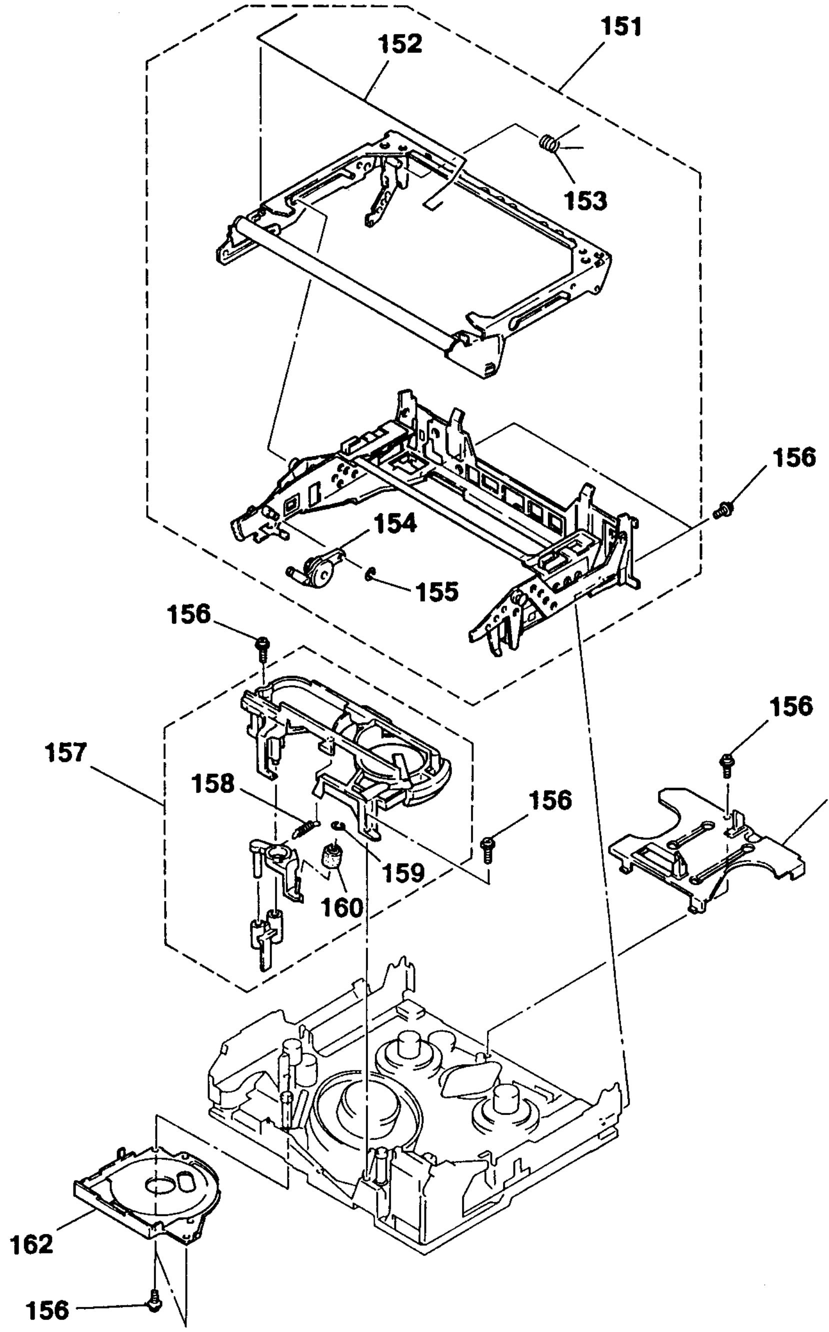
Ref. No.	Part No.	Description	Remark
* 101	3-946-183-01	CASE (MAIN), SHIELD, PS	
102	A-7063-305-A	PS-308P BOARD, COMPLETE	
* 103	X-3941-499-1	SHIELD (LID) ASSY, PS	
104	X-3941-320-1	LID ASSY, LS	
105	1-692-025-11	SWITCH, PUSH	
106	3-948-339-01	SCREW (BTP) (2X5), HEAD	
107	1-643-555-11	FP-558 FLEXIBLE BOARD	
108	3-719-381-01	SCREW (M2X4)	
109	A-7081-889-A	HOLDER (R) ASSY, CS	
110	3-718-233-01	NUT, PLATE	
111	A-7081-888-A	HOLDER (F) ASSY, CS	
112	3-946-175-01	HOLDER (B), CS	
113	X-3941-522-1	PLATE ASSY, SHIELD, DRUM	
114	A-7063-308-A	SL-28P BOARD, COMPLETE	
* 115	3-947-660-01	INSULATOR, SL	
116	1-642-187-11	FP-426 FLEXIBLE BOARD	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
118	A-7063-306-A	CS-37P BOARD, COMPLETE	
* 119	3-946-179-01	CASE (MAIN), SHIELD, FE	
* 120	3-948-499-01	CASE (MAIN), SHIELD, RP	
* 121	X-3941-498-1	SHIELD (LID) ASSY, CAMERA	
* 122	3-946-180-01	CASE (LID), SHIELD, FE	
* 123	3-946-178-01	CASE (LID), SHIELD, RP	
* 124	X-3941-314-1	SHIELD ASSY, CAMERA	
125	A-7063-307-A	VA-77P BOARD, COMPLETE	
* 126	3-946-182-01	CASE (LID), SHIELD, VA	
* 127	3-946-181-01	CASE (MAIN), SHIELD, VA	
128	3-947-268-01	SCREW (B TIGHT) (2), TAPPING	
129	A-7063-304-A	CD-96P BOARD, COMPLETE	
130	3-733-912-31	SCREW (M2X4), SPECIAL HEAD	
131	3-946-857-01	RUBBER (S), SEAL	
132	1-547-558-21	FILTER BLOCK, OPTICAL	
133	1-547-541-11	LENS, ZOOM (VCL-6110WB)(TYPE I)	
133	1-547-586-11	LENS, ZOOM (VCL-6110WE)(TYPE III)	
134	3-946-223-01	HOLDER (C), LENS	
135	3-946-224-01	SHEET METAL, TRIPOD	
136	3-831-441-XX	CUSHION	
* 136	X-3942-278-1	STOPPER ASSY, PS	
* 138	3-950-817-01	SHEET, ADHESIVE, PS	
139	3-946-856-01	ADAPTOR (H), CCD FITTING	
IC901	A-7030-369-A	CCD BLOCK ASSY (AUTO) (ICX055AK-2) (CCD IMAGER)	
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

5-4. CASSETTE COMPARTMENT ASSEMBLY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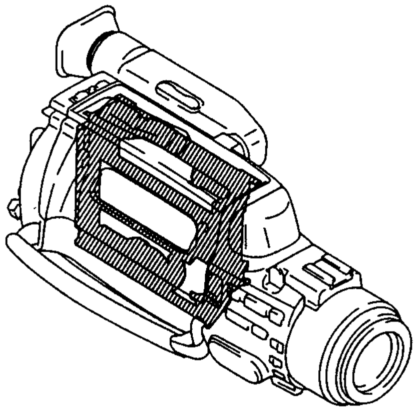
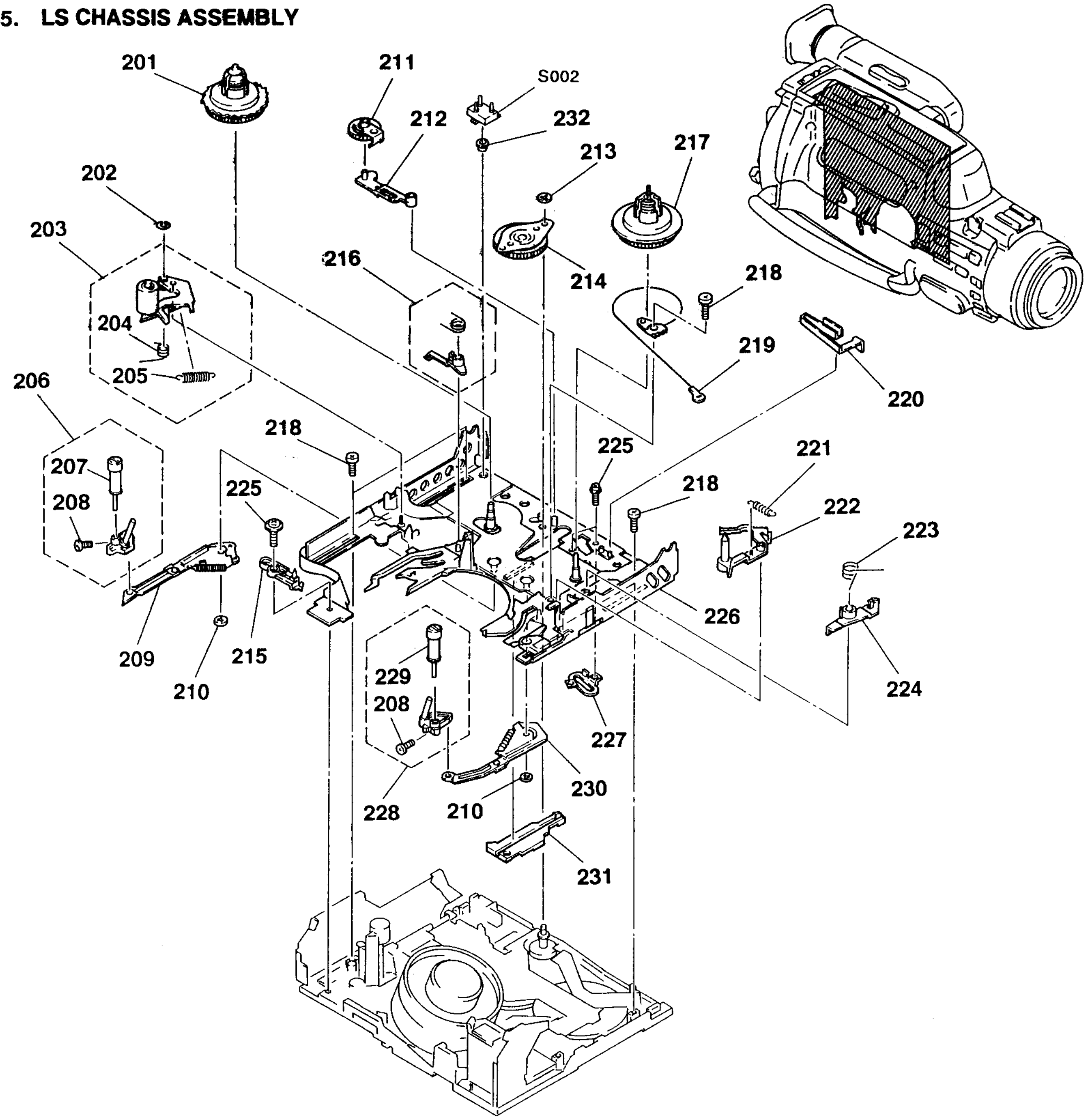


Ref. No.	Part No.	Description	Remark
151	A-7040-312-A	CASSETTE COMPARTMENT BLOCKASSY	
152	3-945-773-01	BAR, TORSION	
153	3-945-771-01	SPRING, TORSION	
154	X-3941-287-2	DAMPER ASSY	
155	3-315-384-31	WASHER, STOPPER	
156	3-947-503-01	SCREW (M1.4X2.5)	
157	A-7040-309-A	PROTECT (BASE) BLOCK ASSY	
158	3-945-760-01	SPRING, TENSION	
159	3-321-393-01	WASHER, STOPPER	
160	X-3726-817-3	ROLLER ASSY, HC	
161	X-3941-280-1	RETAINER ASSY, GOOSENECK	
162	3-945-733-01	COVER, CAPSTAN	

5-5. LS CHASSIS ASSEMBLY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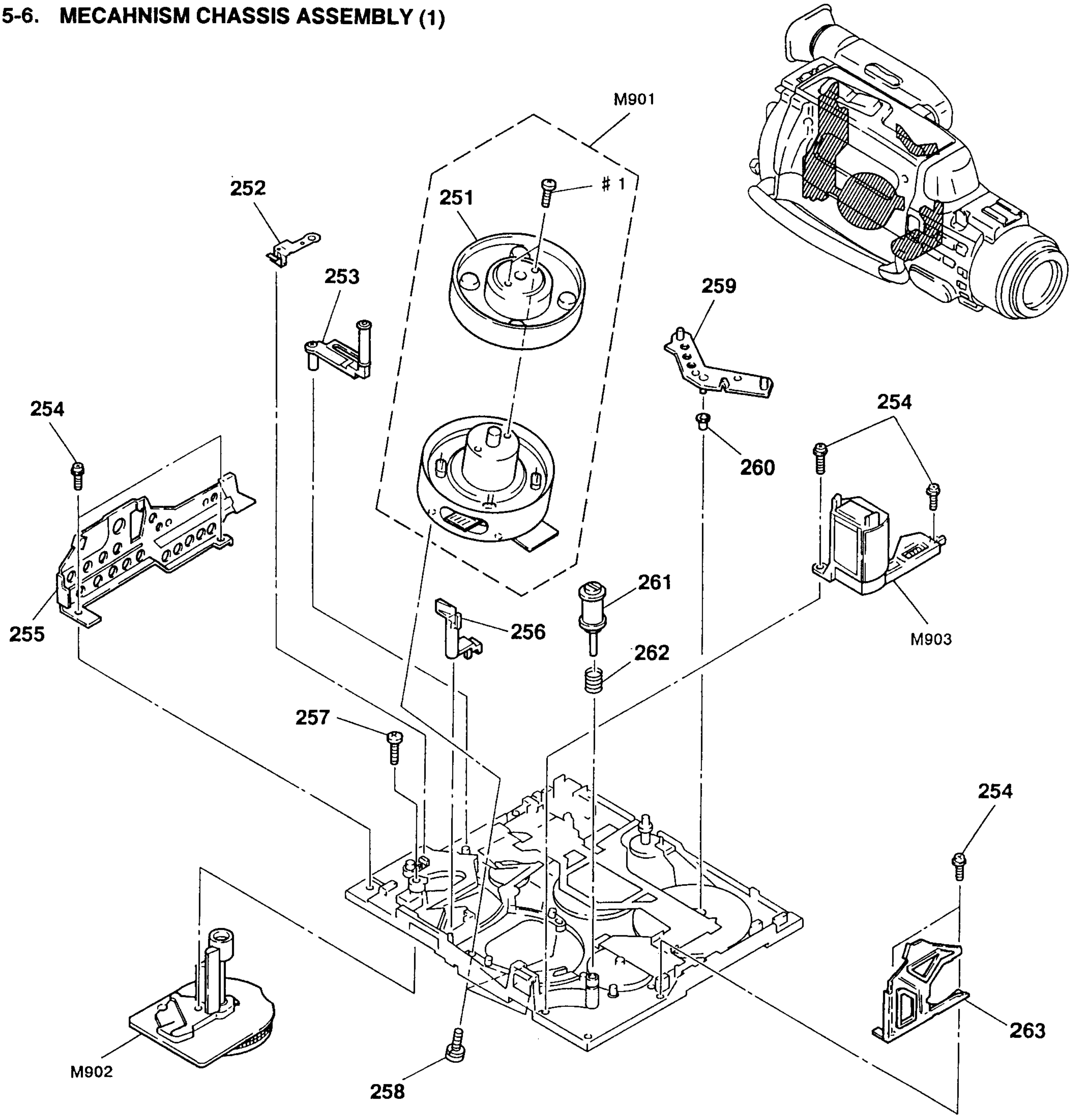
Ref. No.	Part No.	Description	Remark
201	X-3941-274-1	TABLE ASSY, REEL, T	
202	3-331-007-21	WASHER	
203	X-3941-271-1	ARM ASSY, PINCH	
204	3-945-743-01	SPRING, TORSION	
205	3-945-783-01	SPRING, TENSION	
206	A-7040-307-A	GUIDE (BASE) (T) BLOCK ASSY	
207	X-3941-424-1	ROLLER ASSY, TG6	
208	3-947-504-01	SCREW (M1.2X2)	
209	X-3941-267-1	ARM (T) ASSY, GUIDE	
210	3-699-465-00	WASHER (1.5), STOPPER	
211	X-3941-273-1	SOFT ASSY, T	
212	3-945-753-01	ARM, T SOFT	
213	3-726-829-01	WASHER, STOPPER	
214	X-3941-279-1	GEAR ASSY, GOOSENECK	
215	3-947-644-01	RETAINER, TG5 (BASE)	
216	A-7040-321-A	CLAW BLOCK ASSY, T HARD	
217	X-3941-275-1	TABLE ASSY, REEL, S	
218	3-945-756-01	SCREW (M1.4X3)	
219	X-3941-277-1	STRING BLOCK ASSY	
220	3-945-801-01	BRAKE, S SOFT	
221	3-948-810-01	SPRING, TENSION	
222	X-3941-276-1	TG1 ASSY	
223	3-945-752-01	SPRING, TORSION	
224	3-945-799-01	BRAKE, S HARD	
225	3-947-503-01	SCREW (M1.4X2.5)	
226	X-3941-265-1	CHASSIS ASSY, LS	
227	3-945-784-01	PLATE, CAM, LS	
228	A-7040-306-A	GUIDE (BASE) (S) BLOCK ASSY	
229	X-3941-269-1	ROLLER ASSY, TG3	
230	X-3941-266-1	ARM (S) ASSY, GUIDE	
231	3-945-837-01	SLIDER, GL	
232	3-949-881-01	SLEEVE	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	

5-6. MECAHNISM CHASSIS ASSEMBLY (1)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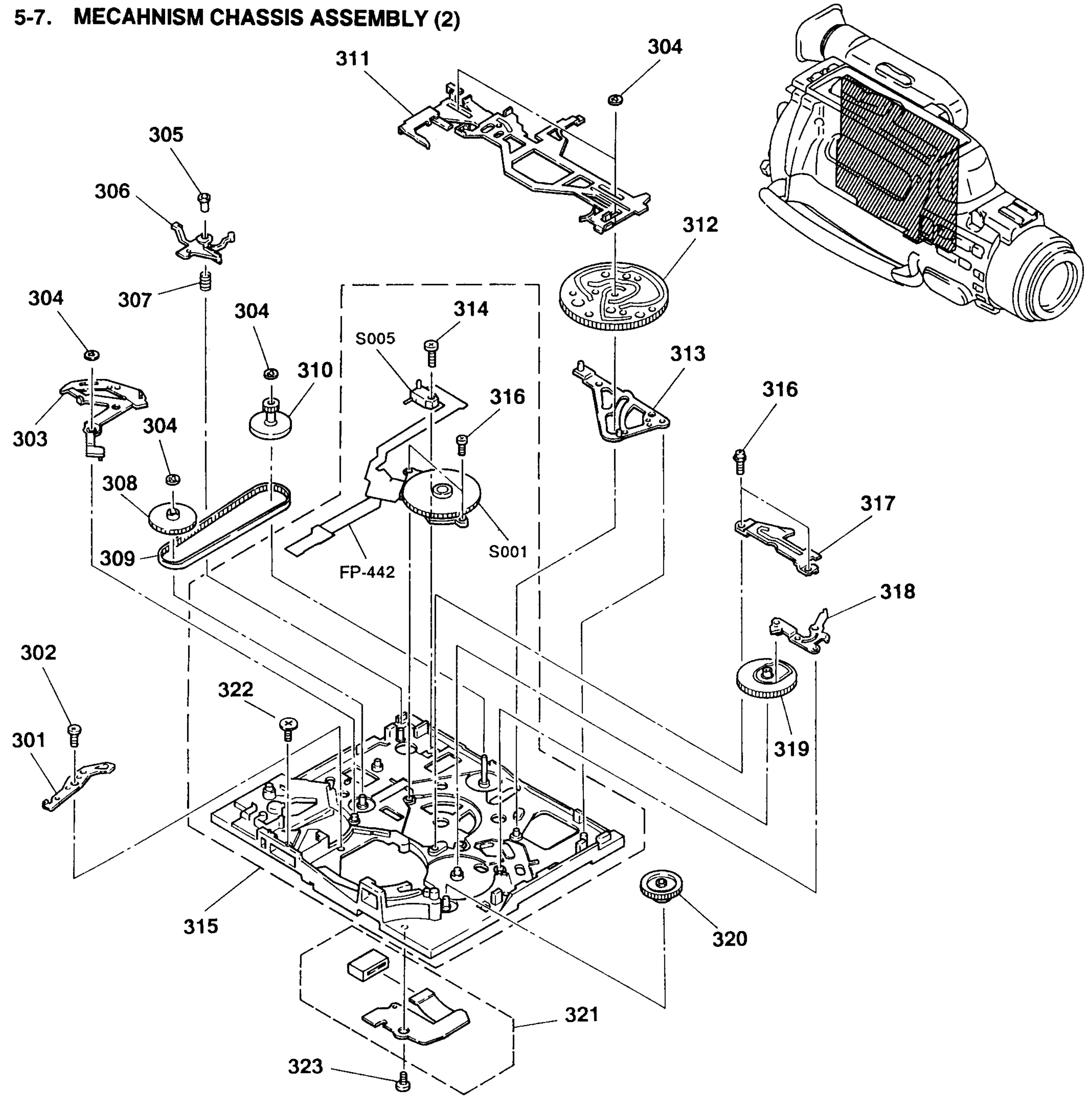
Ref. No.	Part No.	Description	Remark
251	A-7049-521-A	DRUM ASSY, UPPER (DGR-90-R)	
252	3-945-822-01	SPRING, LEAF, TG7 ARM	
253	A-7040-305-A	ARM BLOCK ASSY, TG7	
254	3-947-503-01	SCREW (M1.4X2.5)	
255	X-3941-255-1	PLATE (T) ASSY, SIDE	
256	3-945-735-01	ARM, HC CONVERSION	
257	3-713-786-71	SCREW (M2X5)	
258	3-686-493-01	SCREW (M2X5), P1	
259	3-945-701-01	ARM, LS	
260	3-945-702-01	ROLLER, LS	
261	X-3941-262-1	ROLLER ASSY, TG2	
262	3-945-774-01	SPRING, COMPRESSION	
263	3-945-691-01	PLATE (S), SIDE	
M901	A-7048-585-A	DRUM ASSY (DGH-90A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	

5-7. MECAHNISM CHASSIS ASSEMBLY (2)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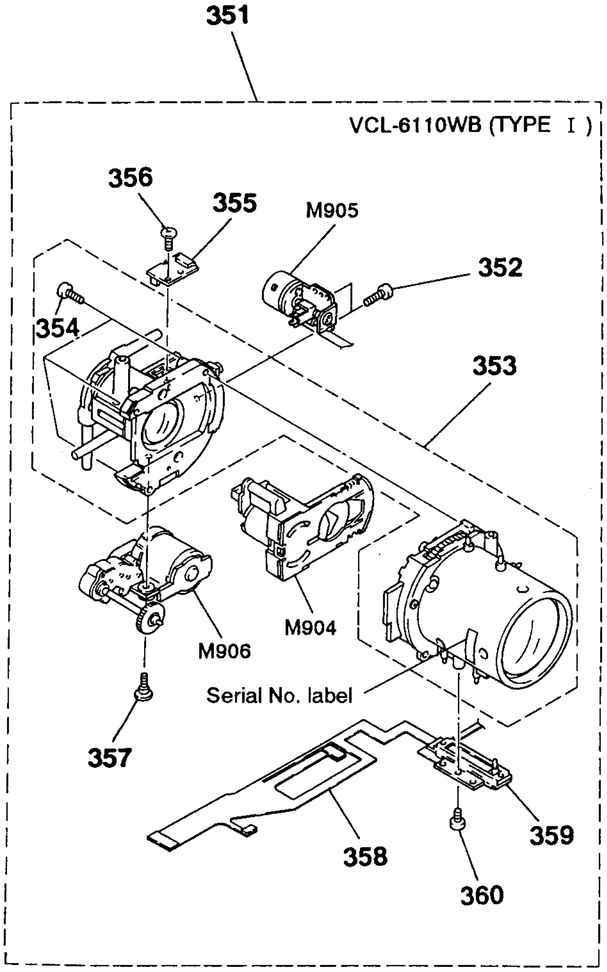
Ref. No.	Part No.	Description	Remark
301	3-945-734-01	ARM, HC DRIVING	
302	3-728-103-11	SCREW (M1.4X1.6), SPECIAL HEAD	
303	X-3941-259-1	ARM ASSY, PINCH PRESS	
304	3-726-829-01	WASHER, STOPPER	
305	3-945-730-01	SLEEVE, EJECT	
306	3-945-706-01	LEVER, EJECT	
307	3-945-729-01	SPRING, COMPRESSION	
308	X-3941-256-1	GEAR ASSY, CHANGE	
309	3-944-539-01	BELT, RELAY	
310	3-945-695-01	PULLEY, RELAY	
311	X-3941-260-1	SLIDER ASSY, M	
312	3-945-696-01	CAM	
313	X-3941-258-1	ARM ASSY, GL	
314	3-713-786-71	SCREW (M2X5)	
315	A-7040-303-A	CHASSIS ASSY, MECHANICAL	
316	3-947-503-01	SCREW (M1.4X2.5)	
317	3-945-722-01	RETAINER, GEAR	
318	X-3941-257-1	ARM ASSY, FF	
319	3-945-697-01	GEAR (B), L	
320	3-945-700-01	GEAR (A), L	
321	A-7040-311-A	FP-444 ASSY	
322	3-946-848-01	SCREW, TG6 ADJUSTMENT	
323	3-945-756-01	SCREW (M1.4X3)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S005	1-570-771-21	SWITCH (C DOWN)	

5-8. ZOOM LENS ASSEMBLY (VCL-6110WB), (VCL-6110WE)

(Distinguishing TYPE I (VCL-6110WB) from TYPE III (VCL-6110WE)
The first letter of serial numbers shown in a serial number label attached to the front of the lens portion begins with capital letter "T" for TYPE I (VCL-6110WB) and "I" for TYPE III (VCL-6110WE).)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VCL-6110WB (TYPE I)
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M906
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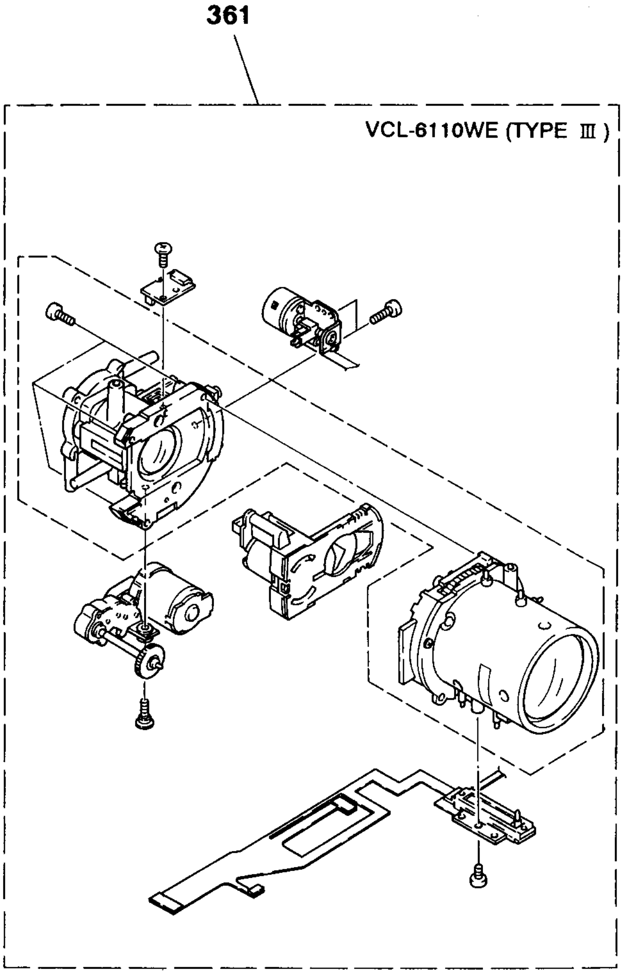
361
VCL-6110WE (TYPE III)

Ref. No.	Part No.	Description	Remark
351	1-547-541-11	LENS, ZOOM (VCL-6110WB) (TYPE I)	
352	3-707-665-01	SCREW BT3P1.7X4C (TYPE I)	
353	3-708-462-01	LENS ASSY (B) (TYPE I)	
354	3-708-568-01	SCREW BT3P2X8C (TYPE I)	
355	3-708-331-01	SENSOR ASSY, RESET (TYPE I)	
356	3-708-570-01	SCREW BT3P1.7X3C (TYPE I)	
357	3-708-569-01	SCREW BT3P2X5C (TYPE I)	
358	3-708-395-01	CHASSIS, RELAY FLEXIBLE (TYPE I)	
359	3-708-393-01	POTENTIAL, ZOOM (TYPE I)	
360	3-708-571-01	SCREW BT2.5P1.7X3 (TYPE I)	
361	1-547-586-11	LENS, ZOOM (VCL-6110WE) (TYPE III)	
M904	3-708-385-01	IRIS ASSY (TYPE I)	
M905	3-708-389-01	MOTOR ASSY, FOCUS (TYPE I)	
M906	3-708-387-01	MOTOR ASSY, ZOOM (TYPE I)	

SECTION 6
ELECTRICAL PARTS LIST

CD-96 **CK-61** **CS-37**

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ, for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description	Remark
	A-7063-304-A	CD-96 BOARD, COMPLETE	
		*********************	
		(Ref. No 1,000 Series)	
		(CAPACITOR)	
C901	1-135-214-21	TANTAL. CHIP 4.7uF 20% 20V	
C902	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C903	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C904	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C905	1-162-637-11	CERAMIC CHIP 0.47uF 16V	
C906	1-126-607-11	ELECT CHIP 47uF 20% 4V	
C907	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C908	1-128-007-11	ELECT CHIP 2.2uF 20% 35V	
C909	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C910	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C911	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C912	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
		(CONNECTOR)	
CN901	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P	
CN902	1-566-537-11	CONNECTOR, FPC (NON ZIF) 5P	
		(DIODE)	
D901	8-719-820-05	DIODE 1SS181	
D903	8-719-820-05	DIODE 1SS181	
D904	8-719-800-76	DIODE 1SS226	
		(COIL)	
L901	1-412-032-11	INDUCTOR CHIP 100uH	
		(TRANSISTOR)	
Q901	8-729-602-21	TRANSISTOR 2SC4154-F	
Q902	8-729-402-13	TRANSISTOR XN1501	
Q903	8-729-232-86	TRANSISTOR 2SK1875	
		(RESISTOR)	
R901	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R902	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R903	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R904	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R905	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R906	1-216-819-11	METAL CHIP 680 5% 1/16W	
R907	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R908	1-216-850-11	METAL CHIP 270K 5% 1/16W	
R909	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R910	1-216-809-11	METAL CHIP 100 5% 1/16W	
R911	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R914	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R915	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R916	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R917	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R921	1-216-835-11	METAL CHIP 15K 5% 1/16W	
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	A-7071-687-A	CK-61 BOARD, COMPLETE	
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		(Ref. No 6,000 Series)	
		(CONNECTOR)	
* CN562	1-580-756-21	PIN, CONNECTOR 7P	
		(DIODE)	
D560	8-719-820-05	DIODE 1SS181	
D561	8-719-404-46	DIODE MA110	
D562	8-719-404-46	DIODE MA110	
D563	8-719-110-03	DIODE RD7.5ES-B2	
D564	8-719-110-03	DIODE RD7.5ES-B2	
D565	8-719-110-03	DIODE RD7.5ES-B2	
D566	8-719-110-03	DIODE RD7.5ES-B2	
D567	8-719-110-03	DIODE RD7.5ES-B2	
D568	8-719-110-03	DIODE RD7.5ES-B2	
		(COIL)	
L560	1-412-028-11	INDUCTOR CHIP 4.7uH	
		(SWITCH)	
S560	1-692-024-11	SWITCH, ROTARY (PROGRAM AE)	
S564	1-572-938-21	SWITCH, TACTIL (DATA +)	
S565	1-572-938-21	SWITCH, TACTIL (TIME)	
S566	1-572-938-21	SWITCH, TACTIL (AGE/EVENT)	
S567	1-692-111-11	SWITCH, KEY BOARD (BACK LIGHT)	
S568	1-692-111-11	SWITCH, KEY BOARD (FADER)	
		(CABLE, FLAT)	
W561	1-690-602-11	CABLE, FLAT (FFC-23) 16P	
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Ref. No.	Part No.	Description	Remark
	A-7063-306-A	CS-37 BOARD, COMPLETE	
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		(Ref. No 1,000 Series)	
	X-3941-498-1	CASE (LID), SHIELD, CAMERA	
*	3-946-178-01	CASE (LID), SHIELD, RP	
*	3-946-179-01	CASE (MAIN), SHIELD, FE	
*	3-946-180-01	CASE (LID), SHIELD, FE	
*	3-948-499-01	CASE (MAIN), SHIELD, RP	
		(CAPACITOR)	
C001	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C002	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C003	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C004	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C005	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C006	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C007	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C008	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C009	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C010	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C011	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C012	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C013	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C014	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C016	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C017	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C018	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C019	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C020	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C021	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C022	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C023	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C024	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C025	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C026	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C028	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C041	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C042	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C043	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C044	1-162-927-11	CERAMIC CHIP 100PF 5% 50V	
C045	1-164-217-11	CERAMIC CHIP 150PF 5% 50V	
C046	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C501	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C502	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C503	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C504	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C505	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C506	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C507	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C508	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C509	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C510	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C511	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C512	1-164-173-11	CERAMIC CHIP 0.0039uF 10% 50V	
C513	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C514	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C515	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C517	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C518	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C519	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C520	1-164-489-11	CERAMIC CHIP 0.22uF 10% 16V	
C521	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C522	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C523	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C524	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C525	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C526	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C527	1-163-035-00	CERAMIC CHIP 0.047uF 50V	
C528	1-128-006-11	ELECT CHIP 4.7uF 20% 25V	
C529	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C530	1-162-918-11	CERAMIC CHIP 18PF 5% 50V	
C531	1-162-917-11	CERAMIC CHIP 15PF 5% 50V	
C532	1-162-905-11	CERAMIC CHIP 1PF 0.25PF50V	
C534	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C535	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C536	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C537	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C538	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C540	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C541	1-126-204-11	ELECT CHIP 47uF 20% 16V	
C542	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C543	1-164-107-11	CERAMIC CHIP 0.15uF 10% 16V	
C544	1-164-107-11	CERAMIC CHIP 0.15uF 10% 16V	
C546	1-128-008-11	ELECT CHIP 3.3uF 20% 35V	
C547	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C548	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C549	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C550	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C551	1-162-967-11	CERAMIC CHIP 0.0033uF 10% 50V	
C552	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C553	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C554	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C555	1-164-222-11	CERAMIC CHIP 0.22uF 25V	
C556	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C558	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C559	1-126-204-11	ELECT CHIP 47uF 20% 16V	
C560	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C561	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C562	1-162-995-11	CERAMIC CHIP 0.022uF 50V	
C563	1-162-971-11	CERAMIC CHIP 0.001uF 50V	

Ref. No.	Part No.	Description				Remark
C564	1-162-920-11	CERAMIC CHIP	27PF	5%	50V	
C565	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C566	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C567	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C568	1-128-006-11	ELECT CHIP	4. 7uF	20%	25V	
C569	1-164-337-11	CERAMIC CHIP	2. 2uF		16V	
C570	1-162-962-11	CERAMIC CHIP	470PF	10%	50V	
C571	1-162-961-11	CERAMIC CHIP	330PF	10%	50V	
C572	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C573	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C574	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V	
C575	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C576	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C577	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C578	1-164-222-11	CERAMIC CHIP	0. 22uF		25V	
C579	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C580	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C582	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V	
C583	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C584	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C586	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	
C587	1-162-921-11	CERAMIC CHIP	33PF	5%	50V	
C588	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V	
C589	1-164-633-11	CERAMIC CHIP	0. 1uF	10%	25V	
C590	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V	
C591	1-162-969-11	CERAMIC CHIP	0. 0068uF	10%	25V	
C592	1-162-969-11	CERAMIC CHIP	0. 0068uF	10%	25V	
C593	1-163-809-11	CERAMIC CHIP	0. 047uF	10%	25V	
C594	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V	
C595	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C701	1-135-149-21	TANTALUM CHIP	2. 2uF	20%	10V	
C702	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V	
C703	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C705	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C706	1-164-004-11	CERAMIC CHIP	0. 1uF	10%	25V	
C707	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C708	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C709	1-164-634-11	CERAMIC CHIP	1uF		16V	
C710	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C711	1-135-181-21	TANTALUM CHIP	4. 7uF	20%	6. 3V	
C712	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C713	1-163-077-00	CERAMIC CHIP	0. 1uF	10%	25V	
C714	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C717	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V	
C718	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C719	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C721	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C724	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C725	1-135-181-21	TANTALUM CHIP	4. 7uF	20%	6. 3V	
C726	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	

Ref. No.	Part No.	Description				Remark
C729	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C731	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V	
C733	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C734	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V	
C736	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C737	1-135-181-21	TANTALUM CHIP	4. 7uF	20%	6. 3V	
C738	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C739	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C741	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C743	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C745	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C749	1-135-181-21	TANTALUM CHIP	4. 7uF	20%	6. 3V	
C752	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C753	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C754	1-162-943-11	CERAMIC CHIP	15PF	5%	50V	
C756	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C757	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C801	1-135-259-11	TANTAL. CHIP	10uF	20%	6. 3V	
C802	1-162-917-11	CERAMIC CHIP	15PF	5%	50V	
C803	1-135-181-21	TANTALUM CHIP	4. 7uF	20%	6. 3V	
C804	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C805	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C806	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V	
C807	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C808	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C809	1-135-181-21	TANTALUM CHIP	4. 7uF	20%	6. 3V	
C810	1-163-077-00	CERAMIC CHIP	0. 1uF	10%	25V	
C811	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C813	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C814	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V	
C815	1-135-181-21	TANTALUM CHIP	4. 7uF	20%	6. 3V	
C816	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C817	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C818	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C819	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C820	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C821	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C823	1-135-091-00	TANTALUM CHIP	1uF	20%	16V	
C826	1-164-156-11	CERAMIC CHIP	0. 1uF		25V	
C828	1-163-077-00	CERAMIC CHIP	0. 1uF	10%	25V	
C831	1-163-077-00	CERAMIC CHIP	0. 1uF	10%	25V	
C832	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V	
C833	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C834	1-163-077-00	CERAMIC CHIP	0. 1uF	10%	25V	
C835	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C836	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V	
C837	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C838	1-135-145-11	TANTALUM CHIP	0. 47uF	10%	35V	
C839	1-162-974-11	CERAMIC CHIP	0. 01uF		50V	
C840	1-163-077-00	CERAMIC CHIP	0. 1uF	10%	25V	

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Ref. No.	Part No.	Description	Remark
C851	1-164-004-11	CERAMIC CHIP 0.1uF 10% 25V	
C852	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C853	1-162-638-11	CERAMIC CHIP 1uF 16V	
C854	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C855	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C856	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C857	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C858	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C859	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C861	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C862	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C863	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C864	1-162-638-11	CERAMIC CHIP 1uF 16V	
C865	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C866	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C868	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C869	1-164-005-11	CERAMIC CHIP 0.47uF 25V	
C870	1-164-173-11	CERAMIC CHIP 0.0039uF 10% 50V	
C872	1-162-638-11	CERAMIC CHIP 1uF 16V	
C875	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
		〈 CONNECTOR 〉	
CN001	1-569-775-21	PIN, CONNECTOR 5P	
CN002	1-691-492-21	CONNECTOR, FFC/FPC 13P	
CN501	1-691-520-11	CONNECTOR, BOARD TO BOARD 48P	
CN502	1-691-539-11	CONNECTOR, BOARD TO BOARD 30P	
CN503	1-691-530-11	CONNECTOR, BOARD TO BOARD 40P	
CN504	1-691-524-11	CONNECTOR, BOARD TO BOARD 20P	
CN505	1-691-495-21	CONNECTOR, FFC/FPC 16P	
CN507	1-691-494-21	CONNECTOR, FFC/FPC 15P	
CN701	1-573-372-21	CONNECTOR, BOARD TO BOARD 18P	
CN801	1-691-475-21	CONNECTOR, BOARD TO BOARD 18P	
CN851	1-573-361-11	CONNECTOR, FFC/FPC 21P	
CN852	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	
		〈 TRIMMER 〉	
CT801	1-141-356-11	CAP, ADJ 6PF	
		〈 DIODE 〉	
⚠D501	8-719-421-27	DIODE MA728	
D502	8-719-404-46	DIODE MA110	
D503	8-719-110-03	DIODE RD7.5ES-B2	
D504	8-719-941-86	DIODE DAN202U	
D505	8-719-110-03	DIODE RD7.5ES-B2	
D506	8-719-110-03	DIODE RD7.5ES-B2	
D507	8-719-404-46	DIODE MA110	
		〈 FILTER 〉	
FL701	1-402-713-21	COIL, OSC (PAL)	

Ref. No.	Part No.	Description	Remark
		〈 IC 〉	
IC001	8-752-033-38	IC CXA1202R	
IC501	8-759-058-96	IC TB1206F	
IC502	8-759-999-02	IC TL1596CDB	
IC503	8-752-838-46	IC CXP80624-410Q	
IC505	8-759-990-55	IC CXA8006M	
IC506	8-759-088-92	IC uPD75316GF-303-3B9	
⚠IC507	8-759-511-22	IC CXA1448N	
IC508	8-759-512-69	IC S-81350HG-KD	
IC509	8-759-145-63	IC uPD7564G-540	
IC510	8-759-039-01	IC MPC1720M	
IC511	8-759-044-78	IC AK6420F	
IC701	8-759-031-58	IC SC7SU04F	
IC702	8-759-635-27	IC M62352GP	
IC703	8-759-069-29	IC uPD6456GS-618	
IC704	8-752-348-92	IC CXD2101AR	
IC705	8-759-063-18	IC CXD2103AR	
IC706	8-752-337-36	IC CXD2104N	
IC707	8-752-347-93	IC CXD2100AQ	
IC709	8-752-837-59	IC CXP80624-299Q	
IC712	8-759-044-78	IC AK6420F-SGX2060	
IC801	8-752-350-16	IC CXD1257AR	
IC802	8-752-056-39	IC CXA1507BR	
IC803	8-752-053-26	IC CXA1399Q	
IC804	8-752-327-48	IC CXD1250N	
IC805	8-752-054-61	IC CXA1390AR	
IC851	8-759-701-24	IC NJM3414M	
IC852	8-759-998-96	IC LM324D	
IC853	8-759-038-81	IC MPC1724M	
IC854	8-759-823-51	IC LB1830M	
IC855	8-759-998-98	IC LM358D	
		〈 COIL 〉	
L001	1-412-033-11	INDUCTOR CHIP 220uH	
L002	1-412-033-11	INDUCTOR CHIP 220uH	
L003	1-412-033-11	INDUCTOR CHIP 220uH	
L004	1-412-029-11	INDUCTOR CHIP 10uH	
L041	1-412-033-11	INDUCTOR CHIP 220uH	
L042	1-410-381-11	INDUCTOR CHIP 10uH	
L501	1-412-029-11	INDUCTOR CHIP 10uH	
L502	1-412-029-11	INDUCTOR CHIP 10uH	
L503	1-412-028-11	INDUCTOR CHIP 4.7uH	
L504	1-412-028-11	INDUCTOR CHIP 4.7uH	
L506	1-412-029-11	INDUCTOR CHIP 10uH	
L703	1-412-006-31	INDUCTOR CHIP 10uH	
L704	1-412-006-31	INDUCTOR CHIP 10uH	
L705	1-410-993-11	INDUCTOR CHIP 1uH	
L706	1-412-029-11	INDUCTOR CHIP 10uH	
L714	1-412-011-31	INDUCTOR CHIP 27uH	
L715	1-412-029-11	INDUCTOR CHIP 10uH	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
L716	1-412-026-11	INDUCTOR CHIP 1uH	
L717	1-412-029-11	INDUCTOR CHIP 10uH	
L719	1-412-006-31	INDUCTOR CHIP 10uH	
L722	1-412-006-31	INDUCTOR CHIP 10uH	
L723	1-410-391-11	INDUCTOR CHIP 68uH	
L730	1-412-026-11	INDUCTOR CHIP 1uH	
L731	1-412-026-11	INDUCTOR CHIP 1uH	
L732	1-412-026-11	INDUCTOR CHIP 1uH	
L733	1-412-979-21	INDUCTOR 1uH	
L734	1-412-979-21	INDUCTOR 1uH	
L801	1-412-029-11	INDUCTOR CHIP 10uH	
L802	1-412-006-31	INDUCTOR CHIP 10uH	
L803	1-412-029-11	INDUCTOR CHIP 10uH	
L804	1-412-029-11	INDUCTOR CHIP 10uH	
L851	1-412-029-11	INDUCTOR CHIP 10uH	
L852	1-410-993-11	INDUCTOR CHIP 1uH	
L853	1-412-029-11	INDUCTOR CHIP 10uH	
		〈 LINK, IC 〉	
⚠PS501	1-576-123-21	LINK, IC (CCP2E20 0.8A)	
		〈 TRANSISTOR 〉	
Q001	8-729-420-20	TRANSISTOR XN4312	
Q002	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q003	8-729-905-12	TRANSISTOR DTA144EU	
Q041	8-729-905-23	TRANSISTOR 2SA1576-R	
Q043	8-729-216-22	TRANSISTOR 2SA1162-G	
Q501	8-729-907-00	TRANSISTOR DTC114EU	
Q502	8-729-402-78	TRANSISTOR XN6401	
Q503	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q507	8-729-905-12	TRANSISTOR DTA144EU	
Q509	8-729-822-84	TRANSISTOR 2SB1202FAST	
Q510	8-729-402-81	TRANSISTOR XN4501	
Q511	8-729-402-81	TRANSISTOR XN4501	
Q702	8-729-402-84	TRANSISTOR XN4601	
Q703	8-729-010-60	TRANSISTOR MSA1586-BC	
Q704	8-729-010-60	TRANSISTOR MSA1586-BC	
Q707	8-729-010-75	TRANSISTOR MSC4116-BC	
Q708	8-729-920-XX	TRANSISTOR DTA114EU	
Q709	8-729-905-61	TRANSISTOR DTC124EU	
Q801	8-729-423-52	TRANSISTOR 2SC3931-C	
Q802	8-729-403-27	TRANSISTOR XN4401	
Q851	8-729-010-75	TRANSISTOR MSC4116-BC	
Q853	8-729-403-27	TRANSISTOR XN4401	
		〈 RESISTOR 〉	
R001	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R003	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R004	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R005	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R006	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R007	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R008	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R009	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R011	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R012	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R013	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R014	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R015	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R016	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R017	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R018	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R019	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R020	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R021	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R022	1-216-864-11	METAL CHIP 0 5% 1/16W	
R023	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R024	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R025	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R026	1-216-817-11	METAL CHIP 470 5% 1/16W	
R041	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R042	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R043	1-216-815-11	METAL CHIP 330 5% 1/16W	
R044	1-216-817-11	METAL CHIP 470 5% 1/16W	
R046	1-216-801-11	METAL CHIP 22 5% 1/16W	
R047	1-216-818-11	METAL CHIP 560 5% 1/16W	
R048	1-216-864-11	METAL CHIP 0 5% 1/16W	
R501	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R502	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R503	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R504	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R505	1-216-817-11	METAL CHIP 470 5% 1/16W	
R506	1-216-852-11	METAL CHIP 390K 5% 1/16W	
R507	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R508	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R509	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R510	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R511	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R512	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R513	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R514	1-216-854-11	METAL CHIP 560K 5% 1/16W	
R515	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R516	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R517	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R518	1-216-809-11	METAL CHIP 100 5% 1/16W	
R520	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R521	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R522	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R523	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R524	1-216-845-11	METAL CHIP 100K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

CS-37

Ref. No.	Part No.	Description	Remark
R526	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R527	1-216-295-00	METAL CHIP 0 5% 1/10W	
R528	1-216-295-00	METAL CHIP 0 5% 1/10W	
R530	1-216-864-11	METAL CHIP 0 5% 1/16W	
R532	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R533	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R534	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R536	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R537	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R538	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R539	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R540	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R541	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R542	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R543	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R544	1-216-815-11	METAL CHIP 330 5% 1/16W	
R545	1-216-039-00	METAL CHIP 390 5% 1/10W	
R547	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R548	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R549	1-217-671-11	METAL CHIP 1 5% 1/10W	
R550	1-217-671-11	METAL CHIP 1 5% 1/10W	
R551	1-217-671-11	METAL CHIP 1 5% 1/10W	
R552	1-217-671-11	METAL CHIP 1 5% 1/10W	
R553	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R555	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R556	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R557	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R559	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R560	1-216-864-11	METAL CHIP 0 5% 1/16W	
R562	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R563	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R564	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R565	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R566	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R567	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R568	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R569	1-216-817-11	METAL CHIP 470 5% 1/16W	
R570	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R571	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R572	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R573	1-216-861-11	METAL CHIP 2.2M 5% 1/16W	
R574	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R575	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R577	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R578	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R579	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R580	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R584	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R585	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R586	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R587	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R589	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R590	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R591	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R592	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R594	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R600	1-216-809-11	METAL CHIP 100 5% 1/16W	
R601	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R603	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R607	1-216-295-00	METAL CHIP 0 5% 1/10W	
R608	1-216-295-00	METAL CHIP 0 5% 1/10W	
R609	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R611	1-216-864-11	METAL CHIP 0 5% 1/16W	
R701	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R702	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R703	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R704	1-216-815-11	METAL CHIP 330 5% 1/16W	
R705	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R706	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R707	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R708	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R709	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R710	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R711	1-216-864-11	METAL CHIP 0 5% 1/16W	
R712	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R713	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R714	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R715	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R716	1-216-863-11	METAL GLAZE 3.3M 5% 1/16W	
R718	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R719	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R722	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R723	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R724	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R727	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R728	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R729	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R730	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R732	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R733	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R734	1-216-817-11	METAL CHIP 470 5% 1/16W	
R735	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R736	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R737	1-216-813-11	METAL CHIP 220 5% 1/16W	
R738	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R739	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R740	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R741	1-216-864-11	METAL CHIP 0 5% 1/16W	
R742	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R745	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	

Ref. No.	Part No.	Description				Remark
R748	1-216-864-11	METAL CHIP	0	5%	1/16W	
R749	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R750	1-216-864-11	METAL CHIP	0	5%	1/16W	
R752	1-216-816-11	METAL CHIP	390	5%	1/16W	
R753	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R754	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R755	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R756	1-216-864-11	METAL CHIP	0	5%	1/16W	
R757	1-216-864-11	METAL CHIP	0	5%	1/16W	
R758	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R759	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R760	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R763	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R764	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R765	1-216-814-11	METAL CHIP	270	5%	1/16W	
R766	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R767	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R769	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R770	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R771	1-216-309-00	METAL CHIP	5.6	5%	1/10W	
R774	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R775	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R776	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R783	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R784	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R785	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R787	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R788	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R793	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R794	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R795	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R796	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R797	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R799	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R801	1-216-864-11	METAL CHIP	0	5%	1/16W	
R802	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R804	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R805	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R808	1-216-801-11	METAL CHIP	22	5%	1/16W	
R810	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R812	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R813	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R814	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R815	1-216-817-11	METAL CHIP	470	5%	1/16W	
R816	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R819	1-216-805-11	METAL CHIP	47	5%	1/16W	
R823	1-218-876-11	METAL CHIP	16K	0.50%	1/16W	
R825	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R826	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R828	1-218-847-11	METAL CHIP	1K	0.50%	1/16W	
R836	1-216-863-11	METAL GLAZE	3.3M	5%	1/16W	
R851	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R852	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R853	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R854	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R855	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R857	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R858	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R859	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R860	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R861	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R862	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R863	1-216-855-11	METAL CHIP	680K	5%	1/16W	
R864	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R865	1-218-879-11	METAL CHIP	22K	0.50%	1/16W	
R866	1-216-820-11	METAL CHIP	820	5%	1/16W	
R867	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R868	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R869	1-218-744-11	METAL CHIP	150K	0.50%	1/16W	
R870	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R871	1-218-871-11	METAL CHIP	10K	0.50%	1/16W	
R872	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R873	1-216-816-11	METAL CHIP	390	5%	1/16W	
R874	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R875	1-216-134-00	METAL CHIP	2.2	5%	1/8W	
R876	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R877	1-218-881-11	METAL CHIP	27K	0.50%	1/16W	
R884	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R885	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R891	1-216-295-00	METAL CHIP	0	5%	1/10W	
R892	1-216-295-00	METAL CHIP	0	5%	1/10W	
R895	1-216-833-11	METAL CHIP	10K	5%	1/16W	
		⟨ NETWORK ⟩				
RB501	1-236-412-11	NETWORK, RES 1.0K				
RB502	1-236-424-11	NETWORK, RES 10K				
RB503	1-236-412-11	NETWORK, RES 1.0K				
RB504	1-236-442-11	NETWORK, RES 330K				
RB505	1-236-424-11	NETWORK, RES 10K				
RB506	1-236-424-11	NETWORK, RES 10K				
RB509	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)				
RB510	1-236-432-11	NETWORK, RES 47K				
RB512	1-236-424-11	NETWORK, RES 10K				
RB513	1-236-432-11	NETWORK, RES 47K				
RB516	1-236-904-11	RESISTOR, NETWORK (CHIP TYPE)				
RB517	1-236-436-11	NETWORK, RES 100K				
RB518	1-236-907-11	RESISTOR, NETWORK (CHIP TYPE)				
RB519	1-236-908-11	RESISTOR, NETWORK (CHIP TYPE)				
RB520	1-236-412-11	NETWORK, RES 1.0K				

Ref. No.	Part No.	Description	Remark
RB522	1-236-424-11	NETWORK, RES 10K	
RB523	1-236-424-11	NETWORK, RES 10K	
RB526	1-236-408-11	NETWORK, RES 470	
RB527	1-236-432-11	NETWORK, RES 47K	
RB528	1-236-432-11	NETWORK, RES 47K	
RB529	1-236-424-11	NETWORK, RES 10K	
RB530	1-236-424-11	NETWORK, RES 10K	
RB702	1-236-432-11	NETWORK, RES 47K	
RB705	1-236-416-11	NETWORK, RES 2.2K	
RB708	1-236-416-11	NETWORK, RES 2.2K	
RB709	1-236-416-11	NETWORK, RES 2.2K	
RB710	1-236-412-11	NETWORK, RES 1.0K	
RB711	1-236-412-11	NETWORK, RES 1.0K	
RB712	1-236-412-11	NETWORK, RES 1.0K	
RB713	1-236-412-11	NETWORK, RES 1.0K	
RB714	1-236-412-11	NETWORK, RES 1.0K	
RB740	1-236-432-11	NETWORK, RES 47K	

(CRYSTAL)

Ref. No.	Part No.	Description	Remark
X501	1-579-368-31	VIBRATOR, CRYSTAL (11.71875MHz)	
X502	1-579-550-11	VIBRATOR, CRYSTAL (32kHz)	
X503	1-578-713-21	VIBLATOR, CERAMIC (4.19MHz)	
X504	1-579-551-11	VIBRATOR, CERAMIC (700kHz)	
X701	1-579-553-11	VIBRATOR (10MHz)	
X801	1-579-076-11	VIBRATOR, CRYSTAL (28.375MHz)	

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1-644-533-21 DK-24 BOARD (Ref. No 7,000 Series)
****

(DIODE)

Ref. No.	Part No.	Description	Remark
D569	8-719-110-03	DIODE RD7.5ES-B2	
D571	8-719-110-03	DIODE RD7.5ES-B2	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S561	1-572-938-21	SWITCH, TACTIL (COUNTER RESET)	
S562	1-572-938-21	SWITCH, TACTIL (ZERO MEM)	
S563	1-572-938-21	SWITCH, TACTIL (TAPE/BATT CHECK)	

(CABLE, FLAT)

Ref. No.	Part No.	Description	Remark
W564	1-642-188-11	FP-510 FLEXIBLE BOARD	

****

A-7071-690-A FL-53 BOARD, COMPLETE
****
(Ref. No 4,000 Series)

(SWITCH)

Ref. No.	Part No.	Description	Remark
S400	1-692-111-11	SWITCH, KEY BOARD (PUSH FOCUS HOLD)	

(CABLE, FLAT)

Ref. No.	Part No.	Description	Remark
W410	1-645-261-11	FP-622 FLEXIBLE BOARD	

****

A-7063-309-A MA-155 BOARD, COMPLETE
****
(Ref. No 3,000 Series)

(CAPACITOR)

Ref. No.	Part No.	Description	Remark
C400	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C401	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C402	1-162-957-11	CERAMIC CHIP 220PF 5% 50V	
C403	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C404	1-162-587-11	CERAMIC CHIP 0.039uF 10% 25V	
C405	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C406	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	
C407	1-162-638-11	CERAMIC CHIP 1uF 16V	
C410	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C411	1-162-638-11	CERAMIC CHIP 1uF 16V	
C412	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C415	1-162-638-11	CERAMIC CHIP 1uF 16V	
C417	1-164-299-11	CERAMIC CHIP 0.22uF 10% 25V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN400	1-580-057-11	PIN, CONNECTOR 4P	

(DIODE)

Ref. No.	Part No.	Description	Remark
D400	8-719-110-03	DIODE RD7.5ES-B2	
D401	8-719-110-03	DIODE RD7.5ES-B2	

(IC)

Ref. No.	Part No.	Description	Remark
IC400	8-759-822-37	IC LA7293M-TE-L	

(JACK)

Ref. No.	Part No.	Description	Remark
J400	1-568-027-11	JACK, SMALL TYPE 1P (MIC)	

(COIL)

Ref. No.	Part No.	Description	Remark
L400	1-410-993-11	INDUCTOR CHIP 1uH	
L401	1-410-993-11	INDUCTOR CHIP 1uH	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q400	8-729-905-23	TRANSISTOR 2SA1576-R	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R400	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R401	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R402	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R403	1-216-838-11	METAL CHIP 27K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R405	1-216-864-11	METAL CHIP 0 5% 1/16W	
R407	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R412	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R414	1-216-864-11	METAL CHIP 0 5% 1/16W	
		(CABLE, FLAT)	
W400	1-690-603-11	CABLE, FLAT (FFC-25) 8P	

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A-7071-686-A PJ-50 BOARD, COMPLETE
****
(Ref. No 9,000 Series)

Ref. No.	Part No.	Description	Remark
		(BUZZER)	
BU550	1-529-107-11	BUZZER, PIEZOELECTRIC	
		(CAPACITOR)	
C550	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C551	1-164-634-11	CERAMIC CHIP 1uF 16V	
C552	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C553	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
		(CONNECTOR)	
CN550	1-691-491-21	CONNECTOR, FFC/FPC 12P	
		(DIODE)	
D550	8-719-404-46	DIODE MA110	
D551	8-719-110-03	DIODE RD7.5ES-B2	
D552	8-719-110-03	DIODE RD7.5ES-B2	
D553	8-719-110-03	DIODE RD7.5ES-B2	
D554	8-719-110-03	DIODE RD7.5ES-B2	
		(RESISTOR)	
R554	1-216-864-11	METAL CHIP 0 5% 1/16W	
		(SWITCH)	
S550	1-571-275-31	SWITCH, SLIDE (EDIT)	

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A-7071-689-A PK-35 BOARD, COMPLETE
****
(Ref. No 8,000 Series)

Ref. No.	Part No.	Description	Remark
		(CONNECTOR)	
CN540	1-691-485-21	CONNECTOR, FFC/FPC 6P	
		(DIODE)	
D540	8-719-820-05	DIODE 1SS181	
		(SWITCH)	
S540	1-572-283-11	SWITCH, SLIDE (POWER)	
S541	1-571-275-31	SWITCH, SLIDE (BEEP)	

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A-7063-305-A PS-308 BOARD, COMPLETE
****
(Ref. No 3,000 Series)

Ref. No.	Part No.	Description	Remark
		(CAPACITOR)	
C948	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C949	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C950	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C951	1-164-384-11	CERAMIC CHIP 130PF 5% 50V	
C952	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C953	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C954	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C957	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C958	1-162-965-11	CERAMIC CHIP 0.0015uF 10% 50V	
C959	1-164-227-11	CERAMIC CHIP 0.022uF 10% 25V	
C960	1-164-730-11	CERAMIC CHIP 0.0012uF 5% 50V	
C961	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C962	1-164-633-11	CERAMIC CHIP 0.1uF 10% 25V	
C963	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C965	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C966	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C968	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C969	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C970	1-162-963-11	CERAMIC CHIP 680PF 10% 50V	
C971	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C972	1-162-928-11	CERAMIC CHIP 120PF 5% 50V	
C973	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C974	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C975	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C976	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C977	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C978	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C979	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C980	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C981	1-164-830-11	CERAMIC CHIP 1uF 22% 16V	
C982	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C983	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C984	1-164-337-11	CERAMIC CHIP 2.2uF 16V	
C985	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C986	1-127-558-11	ELECT(SOLID) 10uF 20% 10V	
C987	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C988	1-128-530-11	ELECT CHIP 33uF 20% 10V	
C989	1-127-559-11	ELECT(SOLID) 15uF 20% 6.3V	
C990	1-164-634-11	CERAMIC CHIP 1uF 16V	
C991	1-164-634-11	CERAMIC CHIP 1uF 16V	

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Ref. No.	Part No.	Description	Remark
C992	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C993	1-126-205-11	ELECT CHIP 47uF 20% 6.3V	
C994	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C995	1-127-559-11	ELECT(SOLID) 15uF 20% 6.3V	
C996	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C997	1-162-962-11	CERAMIC CHIP 470PF 10% 50V	
C998	1-128-530-11	ELECT CHIP 33uF 20% 10V	
		(CONNECTOR)	
CN950	1-691-542-21	CONNECTOR, BOARD TO BOARD 48P	
		(DIODE)	
D950	8-719-989-33	DIODE FC806	
D952	8-719-110-03	DIODE RD7.5ES-B2	
D953	8-719-110-03	DIODE RD7.5ES-B2	
D961	8-719-404-46	DIODE MA110	
D962	8-719-110-03	DIODE RD7.5ES-B2	
D963	8-719-110-03	DIODE RD7.5ES-B2	
D964	8-719-404-46	DIODE MA110	
		(IC)	
⚠IC950	8-759-060-94	IC MB3785APFV-G-BND-ER	
		(JACK)	
J950	1-537-281-41	TERMINAL BOARD	
J951	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
J952	1-568-027-11	JACK, SMALL TYPE 1P (EARPHONE)	
		(COIL)	
L950	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L951	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L952	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L953	1-424-519-21	COIL, MOLD CHOKE 1.0uH	
L954	1-424-522-21	COIL, CHOKE 10uH	
L955	1-424-522-21	COIL, CHOKE 10uH	
L956	1-424-522-21	COIL, CHOKE 10uH	
L957	1-424-524-21	COIL, CHOKE 47uH	
L958	1-412-034-11	INDUCTOR CHIP 330uH	
L959	1-412-034-11	INDUCTOR CHIP 330uH	
L960	1-412-027-11	INDUCTOR CHIP 2.2uH	
L961	1-412-029-11	INDUCTOR CHIP 10uH	
L962	1-412-029-11	INDUCTOR CHIP 10uH	
L963	1-412-028-11	INDUCTOR CHIP 4.7uH	
L964	1-424-524-21	COIL, CHOKE 47uH	
L965	1-424-524-21	COIL, CHOKE 47uH	
L966	1-410-369-11	INDUCTOR CHIP 1uH	
L967	1-410-369-11	INDUCTOR CHIP 1uH	
L968	1-412-979-21	INDUCTOR 1uH	
L972	1-412-979-21	INDUCTOR 1uH	
L974	1-412-979-21	INDUCTOR 1uH	
		(LINK, IC)	
⚠PS950	1-532-841-21	LINK, IC (PRF1600 1.6A)	
⚠PS951	1-532-841-21	LINK, IC (PRF1600 1.6A)	
		(TRANSISTOR)	
Q950	8-729-823-95	TRANSISTOR FC149	
Q951	8-729-804-41	TRANSISTOR 2SB1122-S	
Q952	8-729-823-84	TRANSISTOR FP102	
Q953	8-729-823-82	TRANSISTOR FP101	
Q954	8-729-823-82	TRANSISTOR FP101	
Q955	8-729-905-12	TRANSISTOR DTA144EU	
Q957	8-729-011-26	TRANSISTOR 2SJ179	
Q958	8-729-920-48	TRANSISTOR IMH2	
Q959	8-729-011-26	TRANSISTOR 2SJ179	
Q960	8-729-402-81	TRANSISTOR XN4501	
		(RESISTOR)	
R950	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R951	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R952	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R953	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R954	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R955	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R956	1-218-347-11	METAL GLAZE 91K 5% 1/16W	
R957	1-218-332-11	METAL GLAZE 130K 5% 1/16W	
R958	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R959	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R960	1-218-296-11	METAL CHIP 75K 0.50% 1/16W	
R961	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R962	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R964	1-218-720-11	METAL CHIP 15K 0.50% 1/16W	
R965	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R966	1-218-706-11	METAL CHIP 3.9K 0.50% 1/16W	
R967	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R968	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R969	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R970	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R971	1-218-330-11	METAL CHIP 11K 0.50% 1/16W	
R972	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R973	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R974	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R975	1-216-176-00	METAL GLAZE 120 5% 1/8W	
R976	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R977	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R978	1-216-182-00	METAL GLAZE 220 5% 1/8W	
R980	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R981	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R982	1-216-845-11	METAL CHIP 100K 5% 1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
R983	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R984	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R985	1-218-883-11	METAL CHIP 33K 0.50% 1/16W	
R986	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R987	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R988	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R989	1-216-821-11	METAL CHIP 1K 5% 1/16W	

(TRANSFORMER)

Ref. No.	Part No.	Description	Remark
T950	1-450-874-21	TRANSFORMER, DC-DC CONVERTER	

(CRYSTAL)

Ref. No.	Part No.	Description	Remark
X950	1-579-467-11	VIBRATOR, CERAMIC (475kHz)	

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A-7063-308-A SL-28 BOARD, COMPLETE
****
(Ref. No 3,000 Series)

(CAPACITOR)

Ref. No.	Part No.	Description	Remark
C500	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C503	1-128-013-11	ELECT CHIP 1uF 20% 50V	
C504	1-128-004-11	ELECT CHIP 10uF 20% 16V	
C505	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C506	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C507	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN501	1-691-473-21	CONNECTOR, FFC/FPC 7P	
CN502	1-691-472-21	CONNECTOR, FFC/FPC 6P	
CN503	1-691-482-21	CONNECTOR, FFC/FPC 15P	

(DIODE)

Ref. No.	Part No.	Description	Remark
D511	8-719-110-03	DIODE RD7.5ES-B2	

(IC)

Ref. No.	Part No.	Description	Remark
IC501	8-759-059-09	IC LB8111V	

(COIL)

Ref. No.	Part No.	Description	Remark
L501	1-412-026-11	INDUCTOR CHIP 1uH	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q501	8-729-402-81	TRANSISTOR XN4501	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R501	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R504	1-216-864-11	METAL CHIP 0 5% 1/16W	
R506	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R512	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R514	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R517	1-216-174-00	METAL GLAZE 100 5% 1/8W	
R519	1-216-864-11	METAL CHIP 0 5% 1/16W	
R520	1-216-864-11	METAL CHIP 0 5% 1/16W	

(NETWORK)

Ref. No.	Part No.	Description	Remark
RB500	1-236-424-11	NETWORK, RES 10K	
RB502	1-236-424-11	NETWORK, RES 10K	

(CABLE, FLAT)

Ref. No.	Part No.	Description	Remark
W500	1-644-461-21	FP-600 FLEXIBLE BOARD	
W501	1-642-186-11	FP-437 FLEXIBLE BOARD	

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A-7071-685-A SW-206 BOARD, COMPLETE
****
(Ref. No 5,000 Series)

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN580	1-691-483-21	CONNECTOR, FFC/FPC 4P	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S580	1-692-111-11	SWITCH, KEY BOARD (START/STOP)	
S581	1-571-275-31	SWITCH, SLIDE (STANDBY)	

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A-7063-307-A VA-77 BOARD, COMPLETE
****
(Ref. No 1,000 Series)

Ref. No.	Part No.	Description	Remark
*	3-946-181-01	CASE (MAIN), SHIELD, VA	
*	3-946-182-01	CASE (LID), SHIELD, VA	

(CAPACITOR)

Ref. No.	Part No.	Description	Remark
C052	1-162-638-11	CERAMIC CHIP 1uF 16V	
C053	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C054	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C055	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C056	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C057	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C058	1-135-180-21	TANTALUM CHIP 3.3uF 20% 6.3V	
C059	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C060	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C061	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C062	1-162-974-11	CERAMIC CHIP 0.01uF 50V	
C063	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C064	1-162-950-11	CERAMIC CHIP 56PF 5% 50V	
C065	1-162-947-11	CERAMIC CHIP 33PF 5% 50V	
C066	1-162-953-11	CERAMIC CHIP 100PF 5% 50V	

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Ref. No.	Part No.	Description				Remark
C070	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C071	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C072	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C073	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C074	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C075	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C077	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C078	1-162-943-11	CERAMIC CHIP	15PF	5%	50V	
C090	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C091	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C092	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C093	1-164-506-11	CERAMIC CHIP	4.7uF		16V	
C095	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C096	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C101	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C102	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C103	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C104	1-164-145-11	CERAMIC CHIP	390PF	5%	50V	
C105	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C106	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C107	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C108	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	
C109	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	
C110	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V	
C112	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C113	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C114	1-162-942-11	CERAMIC CHIP	12PF	5%	50V	
C115	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C116	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C117	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C119	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C120	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C121	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C123	1-162-922-11	CERAMIC CHIP	39PF	5%	50V	
C124	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V	
C125	1-162-926-11	CERAMIC CHIP	82PF	5%	50V	
C126	1-162-923-11	CERAMIC CHIP	47PF	5%	50V	
C127	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C128	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C201	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C202	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	
C203	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C204	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C205	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C206	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C207	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C208	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C209	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	
C210	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C211	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C212	1-128-008-11	ELECT CHIP	3.3uF	20%	35V	
C213	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C214	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C215	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C217	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C218	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C219	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C221	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C222	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C223	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C224	1-164-222-11	CERAMIC CHIP	0.22uF		25V	
C225	1-164-005-11	CERAMIC CHIP	0.47uF		25V	
C226	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C227	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C228	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C229	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C230	1-126-246-11	ELECT CHIP	220uF	20%	4V	
C231	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C232	1-164-245-11	CERAMIC CHIP	0.015uF	10%	25V	
C234	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C235	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C237	1-164-361-11	CERAMIC CHIP	0.047uF		16V	
C238	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C239	1-162-960-11	CERAMIC CHIP	220PF	10%	50V	
C240	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C241	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C242	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C243	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C244	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C245	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C246	1-162-959-11	CERAMIC CHIP	330PF	5%	50V	
C247	1-164-392-11	CERAMIC CHIP	390PF	5%	50V	
C250	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C251	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C252	1-162-942-11	CERAMIC CHIP	12PF	5%	50V	
C253	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C254	1-164-363-11	CERAMIC CHIP	560PF	5%	50V	
C255	1-162-958-11	CERAMIC CHIP	270PF	5%	50V	
C256	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C257	1-126-207-11	ELECT CHIP	33uF	20%	4V	
C258	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C259	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C260	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C261	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	
C272	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	
C273	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C274	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C275	1-162-955-11	CERAMIC CHIP	150PF	5%	50V	
C276	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C277	1-128-004-11	ELECT CHIP	10uF	20%	16V	

Ref. No.	Part No.	Description				Remark
C279	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C280	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C282	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C291	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C295	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C296	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C303	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C304	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C305	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C308	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C309	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C310	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C311	1-126-192-11	ELECT CHIP	0.68uF	20%	50V	
C312	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V	
C313	1-163-035-00	CERAMIC CHIP	0.047uF		50V	
C314	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C315	1-162-945-11	CERAMIC CHIP	22PF	5%	50V	
C316	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	
C318	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C319	1-162-937-11	CERAMIC CHIP	6PF	0.5PF	50V	
C320	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C321	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C322	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C323	1-162-944-11	CERAMIC CHIP	18PF	5%	50V	
C324	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C325	1-162-954-11	CERAMIC CHIP	120PF	5%	50V	
C326	1-162-951-11	CERAMIC CHIP	68PF	5%	50V	
C327	1-162-950-11	CERAMIC CHIP	56PF	5%	50V	
C328	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C329	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C330	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C331	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C332	1-162-952-11	CERAMIC CHIP	82PF	5%	50V	
C333	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V	
C334	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C335	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C336	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C338	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C339	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C361	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V	
C362	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C363	1-162-947-11	CERAMIC CHIP	33PF	5%	50V	
C364	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C365	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C366	1-162-638-11	CERAMIC CHIP	1uF		16V	
C367	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C368	1-164-383-11	CERAMIC CHIP	110PF	5%	50V	
C369	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C370	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V	
C371	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C372	1-164-145-11	CERAMIC CHIP	390PF	5%	50V	
C373	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C374	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C376	1-162-638-11	CERAMIC CHIP	1uF		16V	
C377	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C378	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C379	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C400	1-124-778-00	ELECT CHIP	22uF	20%	6.3V	
C403	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C404	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C406	1-164-634-11	CERAMIC CHIP	1uF		16V	
C413	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C414	1-164-677-11	CERAMIC CHIP	0.033uF	10%	16V	
C416	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C417	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C426	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C427	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C428	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C429	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C430	1-135-210-11	TANTALUM CHIP	4.7uF	20%	10V	
C432	1-164-634-11	CERAMIC CHIP	1uF		16V	
C434	1-164-634-11	CERAMIC CHIP	1uF		16V	
C435	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V	
C436	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
C439	1-164-634-11	CERAMIC CHIP	1uF		16V	
C440	1-162-949-11	CERAMIC CHIP	47PF	5%	50V	
C442	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C443	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C444	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C446	1-128-013-11	ELECT CHIP	1uF	20%	50V	
C448	1-128-004-11	ELECT CHIP	10uF	20%	16V	
C450	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V	
C453	1-162-977-11	CERAMIC CHIP	0.0018uF	10%	50V	
C454	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C456	1-164-634-11	CERAMIC CHIP	1uF		16V	
C459	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V	
C461	1-126-607-11	ELECT CHIP	47uF	20%	4V	
C490	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C494	1-128-006-11	ELECT CHIP	4.7uF	20%	25V	
C498	1-128-003-11	ELECT CHIP	22uF	20%	4V	
C990	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C991	1-162-974-11	CERAMIC CHIP	0.01uF		50V	
		(FILTER, CERAMIC)				
CF301	1-579-371-11	FILTER, CERAMIC (5.17MHz)				
		(CONNECTOR)				
CN201	1-691-479-21	CONNECTOR, BOARD TO BOARD 40P				
CN202	1-691-476-21	CONNECTOR, BOARD TO BOARD 20P				
CN400	1-691-487-21	CONNECTOR, FFC/FPC 8P				

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Ref. No.	Part No.	Description	Remark
		(DIODE)	
D102	8-719-800-76	DIODE 1SS226	
D201	8-719-941-86	DIODE DAN202U	
D202	8-719-941-86	DIODE DAN202U	
D203	8-719-941-09	DIODE DAP202U	
D205	8-719-941-86	DIODE DAN202U	
D206	8-719-941-86	DIODE DAN202U	
D301	8-719-940-45	DIODE DWA010	
D361	8-719-941-86	DIODE DAN202U	
D362	8-719-941-86	DIODE DAN202U	
D401	8-719-105-32	DIODE RD2.7M-B2	
		(FILTER)	
FL051	1-236-848-21	FILTER, LOW PASS	
FL052	1-239-055-21	FILTER, LOW PASS (CCD. PAL. Y)	
FL053	1-236-834-21	FILTER, LOW PASS	
FL054	1-415-751-21	DELAY LINE, LC (YH)	
FL201	1-239-113-21	FILTER, LOW PASS (REC. Y)	
FL301	1-236-849-21	FILTER, BAND PASS	
FL302	1-236-186-11	FILTER, BAND PASS	
FL361	1-236-850-21	FILTER, BAND PASS	
		(IC)	
IC051	8-752-333-24	IC CXL1506M	
IC052	8-759-710-29	IC NJM2235M	
IC053	8-759-031-84	IC SC7S04F	
IC054	8-752-053-21	IC CXA1211M	
IC201	8-752-036-19	IC CXA1207R	
IC202	8-759-710-29	IC NJM2235M	
IC203	8-759-055-82	IC M62353GP	
IC204	8-759-055-82	IC M62353GP	
IC205	8-759-636-33	IC CXA1452N	
IC206	8-752-053-21	IC CXA1211M	
IC301	8-752-036-20	IC CXA1208R	
IC361	8-759-605-61	IC CXA1203N	
IC400	8-759-234-77	IC TC4S66F	
IC401	8-759-824-22	IC CXA1535R	
		(COIL)	
L051	1-412-026-11	INDUCTOR CHIP 1uH	
L052	1-412-031-11	INDUCTOR CHIP 47uH	
L053	1-412-029-11	INDUCTOR CHIP 10uH	
L054	1-410-656-11	INDUCTOR CHIP 150uH	
L090	1-412-029-11	INDUCTOR CHIP 10uH	
L101	1-412-029-11	INDUCTOR CHIP 10uH	
L102	1-410-385-11	INDUCTOR CHIP 22uH	
L103	1-412-280-31	INDUCTOR 330uH	
L104	1-410-167-41	INDUCTOR CHIP 820uH	
L105	1-410-657-21	INDUCTOR CHIP 180uH	
L109	1-410-657-21	INDUCTOR CHIP 180uH	
L110	1-410-387-11	INDUCTOR CHIP 33uH	
L113	1-410-381-11	INDUCTOR CHIP 10uH	
L114	1-410-380-31	INDUCTOR CHIP 8.2uH	
L115	1-412-280-31	INDUCTOR 330uH	
L116	1-410-655-31	INDUCTOR CHIP 120uH	
L117	1-410-658-31	INDUCTOR CHIP 220uH	
L202	1-412-031-11	INDUCTOR CHIP 47uH	
L203	1-412-029-11	INDUCTOR CHIP 10uH	
L204	1-410-393-11	INDUCTOR CHIP 100uH	
L205	1-410-375-11	INDUCTOR CHIP 3.3uH	
L206	1-410-379-21	INDUCTOR CHIP 6.8uH	
L207	1-410-390-11	INDUCTOR CHIP 56uH	
L209	1-410-658-31	INDUCTOR CHIP 220uH	
L210	1-410-370-31	INDUCTOR CHIP 1.2uH	
L211	1-410-390-11	INDUCTOR CHIP 56uH	
L212	1-410-370-31	INDUCTOR CHIP 1.2uH	
L213	1-410-386-11	INDUCTOR CHIP 27uH	
L302	1-410-386-11	INDUCTOR CHIP 27uH	
L303	1-410-393-11	INDUCTOR CHIP 100uH	
L304	1-410-379-21	INDUCTOR CHIP 6.8uH	
L305	1-410-393-11	INDUCTOR CHIP 100uH	
L306	1-410-655-31	INDUCTOR CHIP 120uH	
L307	1-410-656-11	INDUCTOR CHIP 150uH	
L308	1-410-393-11	INDUCTOR CHIP 100uH	
L990	1-412-026-11	INDUCTOR CHIP 1uH	
		(TRANSISTOR)	
Q051	8-729-920-48	TRANSISTOR IMH2	
Q052	8-729-141-48	TRANSISTOR 2SB624-BV345	
Q053	8-729-905-23	TRANSISTOR 2SA1576-R	
Q054	8-729-905-23	TRANSISTOR 2SA1576-R	
Q055	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q056	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q057	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q060	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q061	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q063	8-729-422-54	TRANSISTOR XN4215	
Q064	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q065	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q066	8-729-905-23	TRANSISTOR 2SA1576-R	
Q067	8-729-905-96	TRANSISTOR DTA114TU	
Q103	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q104	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q110	8-729-920-XX	TRANSISTOR DTA114EU	
Q111	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q114	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q118	8-729-920-48	TRANSISTOR IMH2	
Q119	8-729-905-23	TRANSISTOR 2SA1576-R	
Q120	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q121	8-729-905-23	TRANSISTOR 2SA1576-R	

Ref. No.	Part No.	Description	Remark
Q122	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q202	8-729-905-23	TRANSISTOR 2SA1576-R	
Q204	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q207	8-729-905-12	TRANSISTOR DTA144EU	
Q212	8-729-920-48	TRANSISTOR IMH2	
Q213	8-729-905-18	TRANSISTOR DTC144EU	
Q214	8-729-106-60	TRANSISTOR 2SB1115A-YQ	
Q215	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q216	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q217	8-729-905-12	TRANSISTOR DTA144EU	
Q218	8-729-402-81	TRANSISTOR XN4501	
Q220	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q222	8-729-402-81	TRANSISTOR XN4501	
Q223	8-729-905-12	TRANSISTOR DTA144EU	
Q224	8-729-905-18	TRANSISTOR DTC144EU	
Q225	8-729-905-18	TRANSISTOR DTC144EU	
Q227	8-729-905-18	TRANSISTOR DTC144EU	
Q228	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q229	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q230	8-729-905-23	TRANSISTOR 2SA1576-R	
Q231	8-729-925-42	TRANSISTOR IMT2	
Q232	8-729-905-23	TRANSISTOR 2SA1576-R	
Q233	8-729-925-42	TRANSISTOR IMT2	
Q234	8-729-905-18	TRANSISTOR DTC144EU	
Q235	8-729-905-23	TRANSISTOR 2SA1576-R	
Q302	8-729-402-81	TRANSISTOR XN4501	
Q304	8-729-905-12	TRANSISTOR DTA144EU	
Q306	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q307	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q308	8-729-905-23	TRANSISTOR 2SA1576-R	
Q309	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q310	8-729-905-18	TRANSISTOR DTC144EU	
Q311	8-729-905-23	TRANSISTOR 2SA1576-R	
Q312	8-729-420-20	TRANSISTOR XN4312	
Q313	8-729-905-12	TRANSISTOR DTA144EU	
Q314	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q315	8-729-905-12	TRANSISTOR DTA144EU	
Q316	8-729-920-48	TRANSISTOR IMH2	
Q317	8-729-420-20	TRANSISTOR XN4312	
Q318	8-729-905-18	TRANSISTOR DTC144EU	
Q319	8-729-905-18	TRANSISTOR DTC144EU	
Q361	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q362	8-729-905-18	TRANSISTOR DTC144EU	
Q363	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q364	8-729-905-12	TRANSISTOR DTA144EU	
Q365	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q366	8-729-905-18	TRANSISTOR DTC144EU	
Q367	8-729-905-18	TRANSISTOR DTC144EU	
Q368	8-729-905-12	TRANSISTOR DTA144EU	
Q401	8-729-921-08	TRANSISTOR DTC144TU	

Ref. No.	Part No.	Description	Remark
Q402	8-729-905-18	TRANSISTOR DTC144EU	
Q990	8-729-106-60	TRANSISTOR 2SB1115A-YQ	
Q991	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
		(RESISTOR)	
R051	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R052	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R053	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R054	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R055	1-216-810-11	METAL CHIP 120 5% 1/16W	
R056	1-216-844-11	METAL CHIP 82K 5% 1/16W	
R058	1-216-864-11	METAL CHIP 0 5% 1/16W	
R062	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R063	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R064	1-216-817-11	METAL CHIP 470 5% 1/16W	
R065	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R066	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R067	1-216-842-11	METAL CHIP 56K 5% 1/16W	
R068	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R069	1-216-817-11	METAL CHIP 470 5% 1/16W	
R070	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R071	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R072	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R073	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R074	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R075	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R076	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R077	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R078	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R079	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R081	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R082	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R083	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R085	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R086	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R088	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R089	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R090	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R091	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R092	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R093	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R098	1-216-864-11	METAL CHIP 0 5% 1/16W	
R105	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R106	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R107	1-216-811-11	METAL CHIP 150 5% 1/16W	
R108	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R109	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R110	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R111	1-216-813-11	METAL CHIP 220 5% 1/16W	
R114	1-216-819-11	METAL CHIP 680 5% 1/16W	

Ref. No.	Part No.	Description				Remark
R125	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R126	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R127	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R128	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R129	1-216-817-11	METAL CHIP	470	5%	1/16W	
R130	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R131	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R132	1-216-808-11	METAL CHIP	82	5%	1/16W	
R133	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R137	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R140	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R141	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R142	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R143	1-216-804-11	METAL CHIP	39	5%	1/16W	
R144	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R147	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R148	1-216-818-11	METAL CHIP	560	5%	1/16W	
R150	1-216-817-11	METAL CHIP	470	5%	1/16W	
R151	1-216-817-11	METAL CHIP	470	5%	1/16W	
R152	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R153	1-216-818-11	METAL CHIP	560	5%	1/16W	
R154	1-216-818-11	METAL CHIP	560	5%	1/16W	
R155	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R156	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R157	1-216-864-11	METAL CHIP	0	5%	1/16W	
R158	1-216-817-11	METAL CHIP	470	5%	1/16W	
R159	1-216-815-11	METAL CHIP	330	5%	1/16W	
R201	1-216-820-11	METAL CHIP	820	5%	1/16W	
R202	1-216-820-11	METAL CHIP	820	5%	1/16W	
R203	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R205	1-216-864-11	METAL CHIP	0	5%	1/16W	
R207	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R208	1-216-804-11	METAL CHIP	39	5%	1/16W	
R209	1-216-804-11	METAL CHIP	39	5%	1/16W	
R211	1-216-820-11	METAL CHIP	820	5%	1/16W	
R212	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R213	1-216-804-11	METAL CHIP	39	5%	1/16W	
R214	1-216-804-11	METAL CHIP	39	5%	1/16W	
R215	1-216-807-11	METAL CHIP	68	5%	1/16W	
R216	1-218-740-11	METAL CHIP	100K	0.50%	1/16W	
R217	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R220	1-216-818-11	METAL CHIP	560	5%	1/16W	
R221	1-216-818-11	METAL CHIP	560	5%	1/16W	
R222	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R223	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R224	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R225	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R226	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	
R227	1-218-672-11	METAL CHIP	150	0.50%	1/16W	
R228	1-218-706-11	METAL CHIP	3.9K	0.50%	1/16W	

Ref. No.	Part No.	Description				Remark
R229	1-216-848-11	METAL CHIP	180K	5%	1/16W	
R230	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R231	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R232	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R233	1-218-748-11	METAL CHIP	220K	0.50%	1/16W	
R234	1-218-708-11	METAL CHIP	4.7K	0.50%	1/16W	
R235	1-218-688-11	METAL CHIP	680	0.50%	1/16W	
R236	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R237	1-218-704-11	METAL CHIP	3.3K	0.50%	1/16W	
R239	1-216-817-11	METAL CHIP	470	5%	1/16W	
R244	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R247	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R248	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R249	1-216-864-11	METAL CHIP	0	5%	1/16W	
R250	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R251	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R252	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R253	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R254	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R256	1-216-810-11	METAL CHIP	120	5%	1/16W	
R257	1-216-813-11	METAL CHIP	220	5%	1/16W	
R258	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R260	1-216-815-11	METAL CHIP	330	5%	1/16W	
R261	1-216-864-11	METAL CHIP	0	5%	1/16W	
R262	1-216-815-11	METAL CHIP	330	5%	1/16W	
R263	1-216-820-11	METAL CHIP	820	5%	1/16W	
R264	1-216-864-11	METAL CHIP	0	5%	1/16W	
R265	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R266	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R267	1-216-817-11	METAL CHIP	470	5%	1/16W	
R268	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R269	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R270	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R271	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R272	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R275	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R276	1-216-817-11	METAL CHIP	470	5%	1/16W	
R277	1-216-817-11	METAL CHIP	470	5%	1/16W	
R278	1-216-818-11	METAL CHIP	560	5%	1/16W	
R279	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R280	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R281	1-216-817-11	METAL CHIP	470	5%	1/16W	
R282	1-216-817-11	METAL CHIP	470	5%	1/16W	
R283	1-216-817-11	METAL CHIP	470	5%	1/16W	
R284	1-216-815-11	METAL CHIP	330	5%	1/16W	
R285	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R286	1-216-812-11	METAL CHIP	180	5%	1/16W	
R287	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R288	1-216-864-11	METAL CHIP	0	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R290	1-216-817-11	METAL CHIP 470 5% 1/16W	
R291	1-216-817-11	METAL CHIP 470 5% 1/16W	
R292	1-216-817-11	METAL CHIP 470 5% 1/16W	
R294	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R295	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R296	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R298	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R299	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R301	1-218-740-11	METAL CHIP 100K 0.50% 1/16W	
R305	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R306	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R307	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R308	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R309	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R310	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R311	1-216-817-11	METAL CHIP 470 5% 1/16W	
R312	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R313	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R314	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R315	1-216-834-11	METAL CHIP 12K 5% 1/16W	
R318	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R319	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R320	1-216-817-11	METAL CHIP 470 5% 1/16W	
R321	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R322	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R323	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R324	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R326	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R327	1-216-823-11	METAL CHIP 1.5K 5% 1/16W	
R328	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R329	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R330	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R331	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R332	1-216-818-11	METAL CHIP 560 5% 1/16W	
R333	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R334	1-216-864-11	METAL CHIP 0 5% 1/16W	
R337	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R338	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R339	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R340	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R341	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R342	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R343	1-216-814-11	METAL CHIP 270 5% 1/16W	
R345	1-216-864-11	METAL CHIP 0 5% 1/16W	
R347	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R348	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R351	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R352	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R353	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R354	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R355	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R357	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R358	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R359	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R360	1-216-817-11	METAL CHIP 470 5% 1/16W	
R361	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R362	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R363	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R365	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R366	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R367	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R368	1-216-864-11	METAL CHIP 0 5% 1/16W	
R369	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R370	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R372	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R374	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R375	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R378	1-216-827-11	METAL CHIP 3.3K 5% 1/16W	
R379	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R380	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R381	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R383	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R385	1-216-296-00	METAL CHIP 0 5% 1/8W	
R391	1-216-864-11	METAL CHIP 0 5% 1/16W	
R393	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R400	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R402	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R403	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R404	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R406	1-216-859-11	METAL GLAZE 1.5M 5% 1/16W	
R410	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R412	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R413	1-216-864-11	METAL CHIP 0 5% 1/16W	
R414	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R416	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R417	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R419	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R421	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R423	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R429	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R470	1-216-808-11	METAL CHIP 82 5% 1/16W	
R471	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R472	1-216-841-11	METAL CHIP 47K 5% 1/16W	
R473	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R476	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R478	1-216-864-11	METAL CHIP 0 5% 1/16W	
R480	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R481	1-216-849-11	METAL CHIP 220K 5% 1/16W	
R950	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R953	1-216-813-11	METAL CHIP 220 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R954	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R955	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R956	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R957	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R958	1-216-815-11	METAL CHIP 330 5% 1/16W	
R960	1-216-817-11	METAL CHIP 470 5% 1/16W	
R961	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R962	1-216-815-11	METAL CHIP 330 5% 1/16W	
R963	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R964	1-216-836-11	METAL CHIP 18K 5% 1/16W	
R965	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R990	1-216-830-11	METAL CHIP 5.6K 5% 1/16W	
R991	1-216-138-00	METAL CHIP 3.3 5% 1/8W	
R995	1-216-820-11	METAL CHIP 820 5% 1/16W	
R996	1-216-836-11	METAL CHIP 18K 5% 1/16W	
		< NETWORK >	
RB101	1-236-428-11	NETWORK, RES 22K	
RB201	1-236-424-11	NETWORK, RES 10K	
RB301	1-236-414-11	NETWORK, RES 1.5K	
		< VARIABLE RESISTOR >	
RV051	1-238-087-11	RES, ADJ, CERMET 1K	
		< THERMISTOR >	
TH101	1-809-357-21	THERMISTOR, NTC (2125)	
		< CRYSTAL >	
X301	1-577-117-21	OSCILLATOR, CRYSTAL (4.433619MHz)	

****

A-7063-129-A VF-44 BOARD, COMPLETE
****
(Ref. No 2,000 Series)

Ref. No.	Part No.	Description	Remark
		< CAPACITOR >	
C501	1-163-115-00	CERAMIC CHIP 82PF 5% 50V	
C502	1-126-176-11	ELECT 220uF 20% 10V	
C503	1-163-077-00	CERAMIC CHIP 0.1uF 10% 25V	
C504	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
⚠C505	1-163-053-00	CERAMIC CHIP 0.0033uF 10% 50V	
⚠C506	1-163-058-00	CERAMIC CHIP 0.0082uF 10% 50V	
C508	1-127-515-11	ELECT(SOLID) 47uF 20% 6.3V	
C509	1-126-090-11	ELECT 82uF 20% 10V	
C510	1-164-611-11	CERAMIC CHIP 0.001uF 10% 500V	
C511	1-124-257-00	ELECT 2.2uF 20% 50V	
C512	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C513	1-137-306-11	FILM CHIP 0.1uF 5% 16V	
C514	1-162-638-11	CERAMIC CHIP 1uF 16V	
C515	1-131-381-00	TANTALUM 47uF 10% 10V	
C516	1-163-037-11	CERAMIC CHIP 0.022uF 10% 25V	
C517	1-135-091-00	TANTALUM CHIP 1uF 20% 16V	
		< CONNECTOR >	
* CN501	1-566-762-11	PIN, CONNECTOR (PC BOARD) 7P	
* CN502	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
* CN503	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P	
		< DIODE >	
D501	8-719-024-87	DIODE LN1261CAL	
D502	8-719-024-87	DIODE LN1261CAL	
D503	8-719-400-20	DIODE MA152WA	
		< IC >	
IC501	8-759-420-01	IC AN2512S	
		< COIL >	
L501	1-412-031-11	INDUCTOR CHIP 47uH	
L502	1-410-385-11	INDUCTOR CHIP 22uH	
⚠L503	1-460-220-11	COIL, FERRITE (HLC)	
		< TRANSISTOR >	
Q501	8-729-216-31	TRANSISTOR 2SA1163-G	
Q503	8-729-106-68	TRANSISTOR 2SD1615A-GP	
		< RESISTOR >	
R501	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R502	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R503	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R504	1-216-041-00	METAL CHIP 470 5% 1/10W	
R505	1-216-041-00	METAL CHIP 470 5% 1/10W	
R508	1-216-005-00	METAL CHIP 15 5% 1/10W	
R509	1-216-870-11	METAL CHIP 180K 1% 1/10W	
R510	1-216-079-00	METAL CHIP 18K 5% 1/10W	
R511	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R512	1-216-133-00	METAL CHIP 3.3M 5% 1/10W	
R513	1-216-125-00	METAL CHIP 1.5M 5% 1/10W	
R514	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R515	1-216-055-00	METAL CHIP 1.8K 5% 1/10W	
R516	1-216-025-00	METAL CHIP 100 5% 1/10W	
R517	1-216-308-00	METAL CHIP 4.7 5% 1/10W	
R518	1-216-336-11	METAL CHIP 47K 1% 1/10W	
R519	1-216-107-00	METAL CHIP 270K 5% 1/10W	
R520	1-216-121-00	METAL CHIP 1M 5% 1/10W	
R521	1-216-160-00	METAL GLAZE 27 5% 1/8W	
R522	1-216-053-00	METAL CHIP 1.5K 5% 1/10W	
R523	1-216-113-00	METAL CHIP 470K 5% 1/10W	
R524	1-216-097-00	METAL CHIP 100K 5% 1/10W	
R525	1-216-031-00	METAL CHIP 180 5% 1/10W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
R526	1-216-748-11	METAL CHIP 39K 1% 1/10W	
		(VARIABLE RESISTOR)	
RV501	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV501	1-238-854-11	RES, ADJ, CERMET 2.2K	
RV502	1-241-497-11	RES, ADJ, METAL GLAZE	
RV503	1-238-096-11	RES, ADJ, CERMET 1M	
RV503	1-238-862-11	RES, ADJ, CERMET 1M	
RV504	1-238-092-11	RES, ADJ, CERMET 47K	
RV504	1-238-858-11	RES, ADJ, CERMET 47K	
RV505	1-238-086-11	RES, ADJ, CERMET 470	
RV505	1-238-852-11	RES, ADJ, CERMET 470	
		(SWITCH)	
S501	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT (+))	
S502	1-692-032-21	SWITCH, TACTILE (HORIZONTAL) (EDIT (-))	
		(TRANSFORMER)	
⚠T501	1-439-525-11	TRANSFORMER ASSY, FLYBACK	
		(THERMISTOR)	
TH501	1-809-350-21	THERMISTOR, NTC (2125)	
		(CABLE, FLAT)	
W502	1-526-978-51	SOCKET ASSY, CRT	

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A-7071-684-A VK-28 BOARD, COMPLETE
****
(Ref. No 5,000 Series)

		(CONNECTOR)	
CN571	1-691-487-21	CONNECTOR, FFC/FPC 8P	
CN574	1-691-483-21	CONNECTOR, FFC/FPC 4P	
* CN575	1-580-055-21	PIN, CONNECTOR 2P	
		(DIODE)	
D570	8-719-820-05	DIODE 1SS181	
		(SWITCH)	
S570	1-572-498-11	SWITCH, SLIDE (EJECT)	
S571	1-572-921-31	SWITCH, KEY BOARD (REW)	
S572	1-572-921-31	SWITCH, KEY BOARD (FF)	
S573	1-572-921-31	SWITCH, KEY BOARD (PB)	
S574	1-572-921-31	SWITCH, KEY BOARD (STOP)	
S576	1-572-921-31	SWITCH, KEY BOARD (PAUSE)	

Ref. No.	Part No.	Description	Remark
		(CABLE, FLAT)	
W570	1-642-189-11	FP-511 FLEXIBLE BOARD	
W573	1-690-606-11	CABLE, FLAT (FFC-32) 8P	

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MISCELLANEOUS
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11	1-550-743-11	HOLDER, BATTERY	
23	1-542-126-41	MICROPHONE UNIT	
31	1-690-604-11	CABLE, FLAT (FFC-33) 4P	
⚠57	1-451-310-21	DEFLECTION YOKE (B/W)	
105	1-692-025-11	SWITCH, PUSH	
117	1-691-471-11	CONNECTOR, TRANSLATION 11P	
132	1-547-558-21	FILTER BLOCK, OPTICAL	
133	1-547-541-11	LENS, ZOOM (VCL-6110WB) (TYPE Ⅰ)	
133	1-547-586-11	LENS, ZOOM (VCL-6110WE) (TYPE Ⅲ)	
IC901	A-7030-369-A	CCD BLOCK ASSY (AUTO) (ICX055AK-2) (CCD IMAGER)	
M901	A-7048-585-A	DRUM ASSY (DGH-90A-R)	
M902	8-835-477-01	MOTOR, DC SCE-0101A (CAPSTAN)	
M903	A-7040-304-A	MOTOR BLOCK ASSY, LM (LOADING)	
M904	3-708-385-01	IRIS ASSY (TYPE Ⅰ)	
M905	3-708-389-01	MOTOR ASSY, FOCUS (TYPE Ⅰ)	
M906	3-708-387-01	MOTOR ASSY, ZOOM (TYPE Ⅰ)	
S001	1-572-986-11	SWITCH, ROTARY (ENCODER)	
S002	1-572-987-11	SWITCH, PUSH (3 KEY) (REC PROOF, ME/MP, MP/MP-HG)	
S005	1-570-771-21	SWITCH (C DOWN)	
⚠V901	1-546-091-11	CATHODE-RAY TUBE, B/W	
W400	1-690-603-11	CABLE, FLAT (FCC-25) 8P	
⚠W502	1-540-019-51	SOCKET ASSY, CRT	
W561	1-690-602-11	CABLE, FLAT (FCC-23) 16P	
W573	1-690-606-11	CABLE, FLAT (FCC-32) 8P	

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ACCESSORIES & PACKING MATERIALS
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	1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE) (E)	
	1-571-164-22	SWITCH, ANTENNA CHANGE (CABLE) (UK)	
	1-571-164-42	SWITCH, ANTENNA CHANGE (CABLE) (UK)	
	3-712-673-01	SCREWDRIVER (UK, E)	
*	3-754-318-01	INSTRUCTION (AEP, E)	
	3-755-242-51	MANUAL, INSTRUCTION (ENGLISH) (E, Australian)	
	3-755-242-61	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH) (E)	
	3-755-242-71	MANUAL, INSTRUCTION (ARABIC) (E)	
	3-755-242-81	MANUAL, INSTRUCTION (CHINESE) (E)	
	3-755-543-11	MANUAL, INSTRUCTION (ENGLISH) (AEP, UK)	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
	3-755-543-41	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH) (AEP)	
	3-755-543-51	MANUAL, INSTRUCTION (DUTCH, SWEDISH, ITALIAN) (AEP)	
	3-755-543-61	MANUAL, INSTRUCTION (PORTUGUESE) (AEP)	
	3-755-543-71	MANUAL, INSTRUCTION (DANISH, FINNISH)	(AEP)
	3-783-517-01	BELT (S), SHOULDER	
*	3-947-112-01	CUSHION (LOWER)	
*	3-948-478-31	INDIVIDUAL CARTON	
*	3-951-011-01	CUSHION, ACC	
	A-6767-706-A	RFU ADAPTOR (RFU-89EA) (E)	
	A-6767-707-A	RFU ADAPTOR (RFU-89EA) (UK)	
	A-6768-254-A	RFU ADAPTOR (RFU-90E) (AEP)	
	A-6768-255-A	RFU ADAPTOR (RFU-90AS) (Australian)	
**	AC-V35/V35A	AC POWER ADAPTOR	
***	NP-55	BATTERY PACK	

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE

*** MARK PARTS IS AVAILABLE AS AN OPTIONAL ACCESSORY

****

HARDWARE LIST

****

Ref. No.	Part No.	Description
#1	7-627-853-57	PRECISION SCREW +P2X5

SECTION 7
CAMERA SECTION ADJUSTMENTS

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 202.

7-1. PREPARATIONS BEFORE ADJUSTMENT (CAMERA SECTION)

7-1-1. List of Service Tools

- Oscilloscope
- Adjusting driver
- Stabilized power supply
- Color monitor
- Vectorscope
- Digital voltmeter

Ref. No.	Name	Part Code	Usage
J-1	Filter for color temperature correction (C14)	J-6080-058-A	Auto white balance adjustment/check White balance adjustment/check
J-2	ND filter 1.0	J-6080-808-A	Max gain adjustment (2 used) White balance check
	ND filter 0.4	J-6080-806-A	Max gain adjustment
	ND filter 0.3	J-6080-818-A	White balance adjustment
	ND filter 0.1	J-6080-807-A	Max gain adjustment
J-3	Pattern box PTB-450	J-6082-200-A	
J-4	Color chart for pattern box	J-6020-250-A	
J-5	Adjusting remote control unit (RM-95-remodeled in part)$^{\text{Note 1}}$	J-6082-053-A	
J-6	Siemens star	J-6080-875-A	Flange back check
J-7	Measuring pin for camera section	J-6082-139-A	For the camera section adjustment
J-8	Extension cord (30P, 0.8 mm)	J-6082-167-A	For extension of CS-37 board (For the mecha deck check)
J-9	Extension cord (40P, 0.8 mm)	J-6082-168-A	For extension of VA-77 board (For the video section adjustment)
	Extension cord (20P, 0.8 mm)	J-6082-169-A	For extension of VA-77 board (For the video section adjustment)
	Extension cord (18P, 0.8 mm)	J-6082-170-A	For extension of CD-96 board (For the repair of the camera section)
J-10	Extension cord (21P, 0.5 mm)	J-6082-171-A	For extension of lens block (For the repair of the camera section)
J-11	Extension cord (15P, 0.8 mm)	J-6082-172-A	For extension of cabinet L (PJ-50, VK-28 boards) (For the video section adjustment)
	Extension cord (8P, 0.8 mm)	J-6082-173-A	For extension of cabinet L (PJ-50, VK-28 boards) (For the video section adjustment)

Note: If the micro processor IC in the adjusting remote control unit is not the new micro processor (UPD7503G-C56-12), the switchover of the page cannot be carried out. In this case, replace with the new micro processor (8-759-148-35).

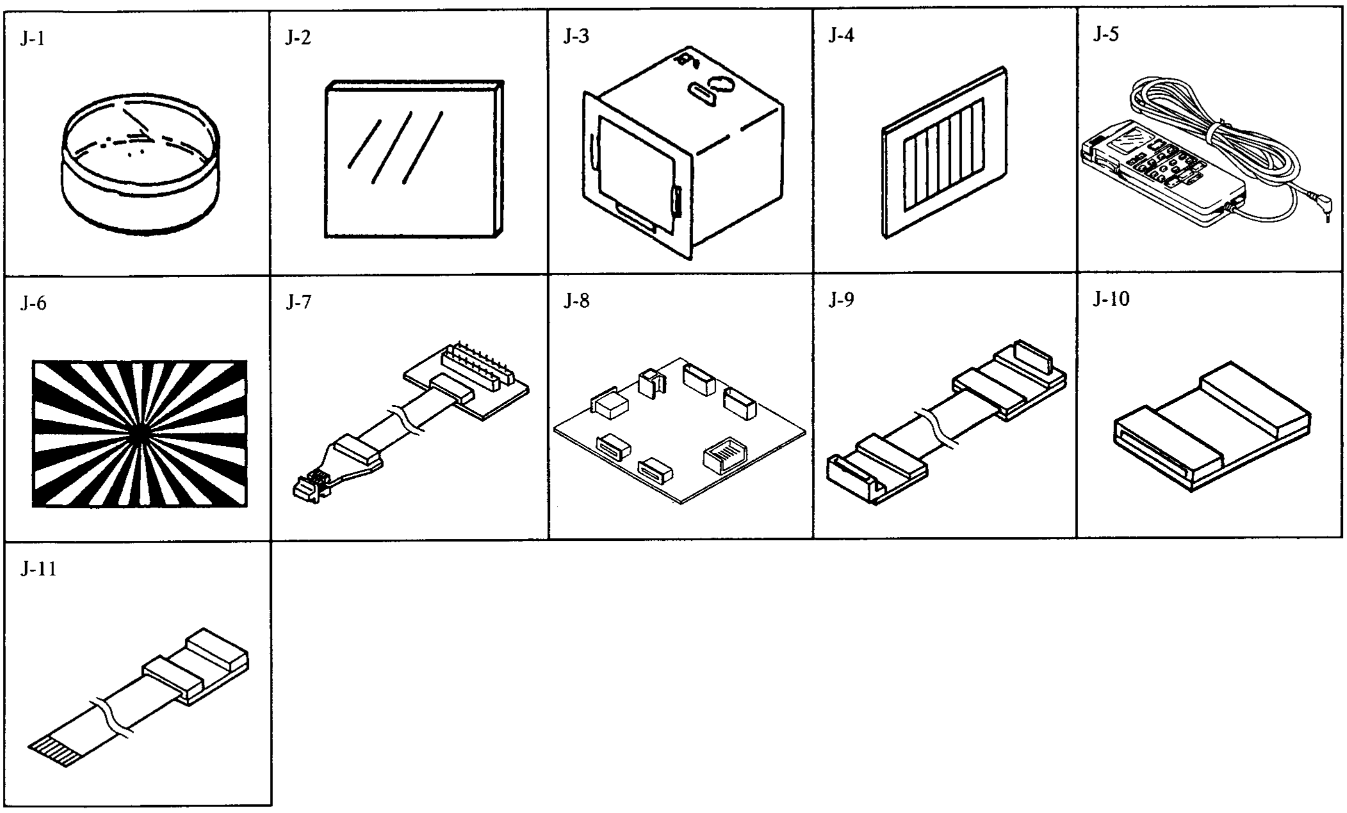

J-1
J-2
J-3
J-4
J-5
J-6
J-7
J-8
J-9
J-10
J-11

Fig. 7-1.

7-1-2. Preparations

Note: For further details on how to remove the cabinet and each board, refer to "1. Disassembly".

1) Connect the equipments for adjustment as shown in Fig. 7-3.

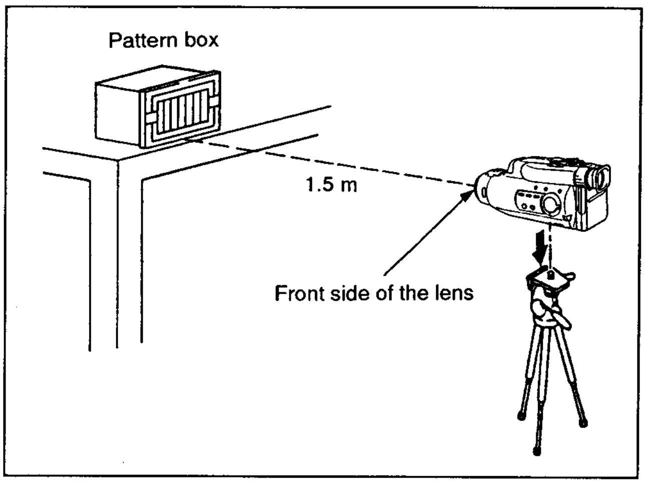

Pattern box
1.5 m
Front side of the lens

Fig. 7-2.

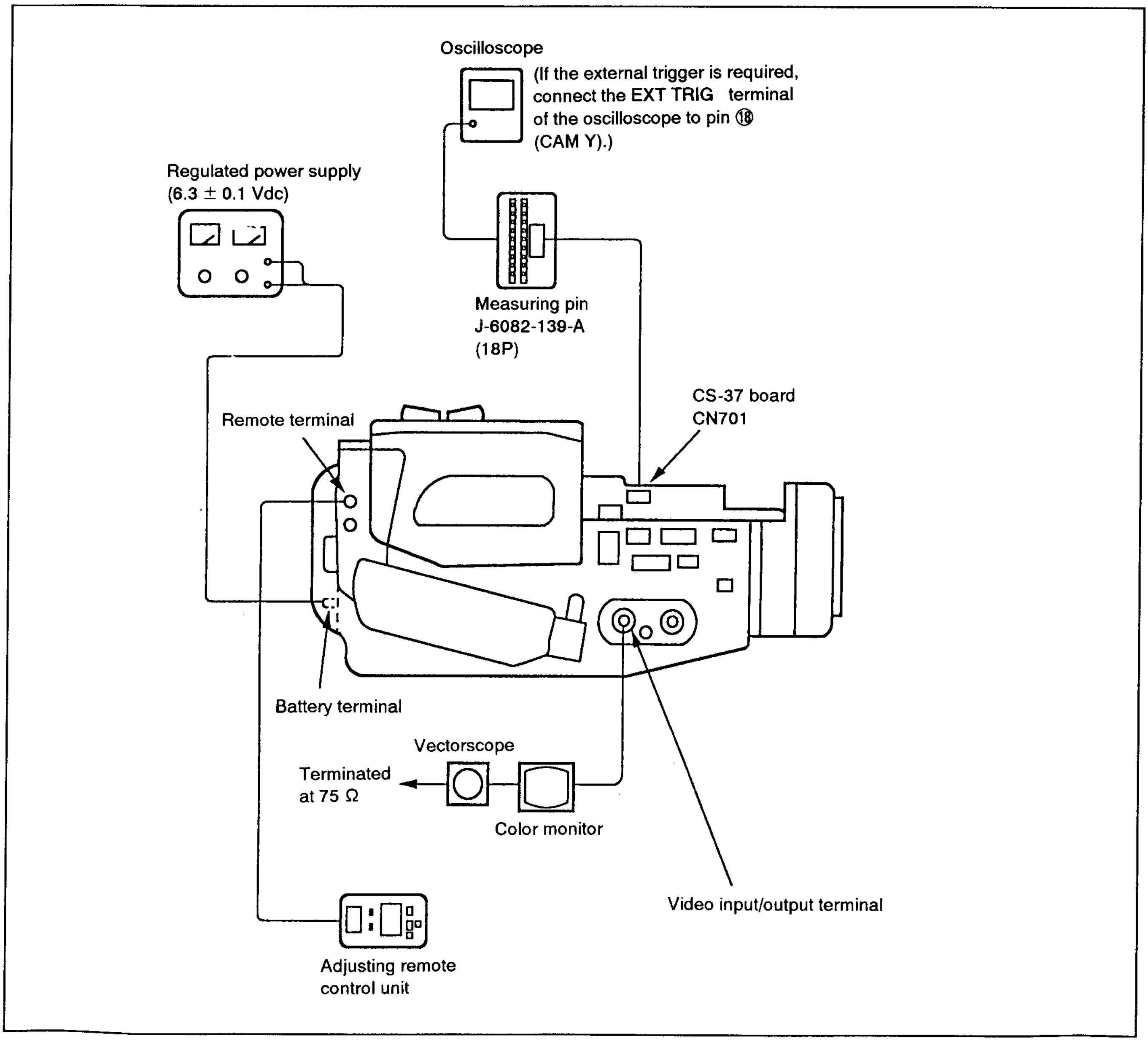

Oscilloscope
(If the external trigger is required, connect the EXT TRIG terminal of the oscilloscope to pin ⑱ (CAM Y).)
Regulated power supply
(6.3 ± 0.1 Vdc)
Measuring pin
J-6082-139-A
(18P)
CS-37 board
CN701
Remote terminal
Battery terminal
Vectorscope
Terminated at 75 Ω
Color monitor
Video input/output terminal
Adjusting remote control unit

Fig. 7-3.

7-1-3. Precautions

1. Switch settings

Adjust the switches to the following positions, and perform the adjustments without inserting the tape, unless specified otherwise.

1. Camera/video power switch (PK-35 board S540) ·····Camera
2. Standby switch (SW-206 board S581)·················Standby
3. AE dial (CK-61 board S560) ································ OFF
4. Back light button (CK-61 board S567) ·····················Off

2. Adjustment Procedure

Perform in the given order as a rule.

3. Subject

1) Color bar chart (Standard picture frame)
   Adjust the display frame as shown in Fig. 7-4. if adjustments are performed using the color bar chart.
   (Standard picture frame)
2) White pattern (Standard picture frame)
   Remove the color bar chart from the pattern box, and adjust the zoom lever so that the white pattern becomes the same size and is in the same position as the color bar chart (Standard picture frame).

Color bar chart standard picture frame

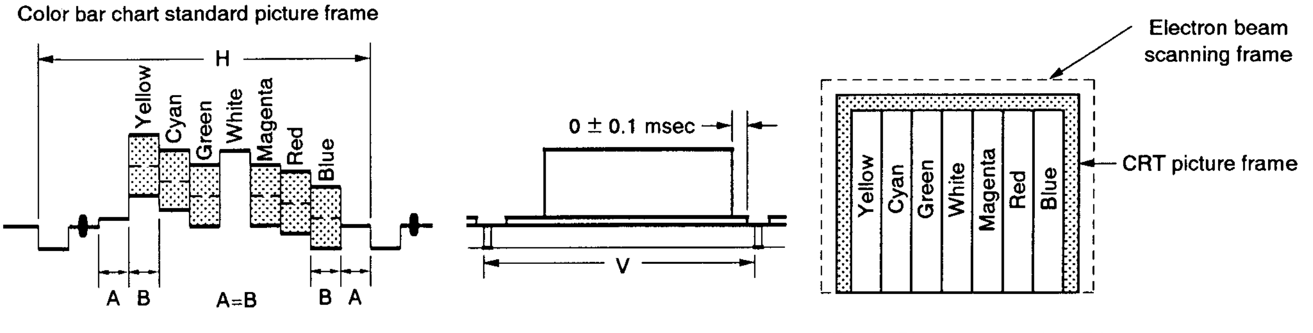

H
Yellow
Cyan
Green
White
Magenta
Red
Blue
A B
A=B
B A
0 ± 0.1 msec
V
Electron beam scanning frame
CRT picture frame
Yellow
Cyan
Green
White
Magenta
Red
Blue

Fig. a (Video input/output terminal output waveform)

Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) Chart for flange back adjustment
   Combine a white A0 size (1189 mm× 841 mm) paper to a black one, and make the chart shown in Fig. 7-5.

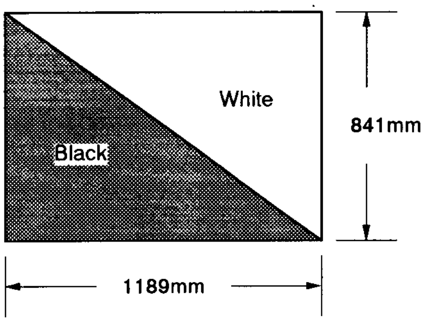

White
Black
841mm
1189mm

Fig. 7-5.

Note: Use the non-reflecting and non-glazing vellum paper whose size is more than A0, and make the boundary between white and black to be smoothly flat.

7-1-4. Adjusting Remote Control Unit

The camera section is adjusted by changing the constant using the coefficient of the digital signal processing calculation, or modifying the output voltage of EVR IC (CS-37 board IC702). These processes are carried out by the camera micro processor (CS-37 board IC709). This micro processor reads the data written in the non-volatile memory (CS-37 board IC712), and transmits it to the digital signal processing circuit and EVR.

The adjusting remote control unit is used for rewriting the adjustment data written in the non-volatile memory necessary for performing the adjustments.

The adjusting remote control unit uses the remote control signal line (LANC) to correspond mutually with the camera micro processor. The page, address and the up/down command of the data can be transmitted from the remote control unit to the camera micro processor. On the other hand, the page, address, and data can also be transmitted the other way round.

1. Using the adjusting remote control unit

1) Connect the adjusting remote control unit to the remote terminal (PS-308 board J951).
2) Adjust the HOLD switch of the adjusting remote control unit to HOLD (SERVICE position).
   If it has been properly connected, the LCD on the adjusting remote control unit will show the display in Fig. 7-6.

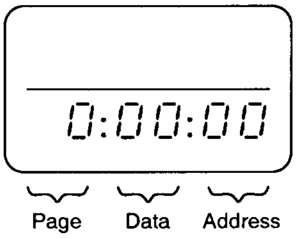


Fig. 7-6.

3) Operate the adjusting remote control unit as follows.
   - Changing the page
     The page will increase when the EDIT SEARCH+ button is pressed. It will decrease when the EDIT SEARCH– button is pressed. There are altogether 16 pages, from 0 to F.

Hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
Display on LCD	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal notation conversion value	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - Changing the address
     The address will increase when the FF (▶▶) button is pressed, and decrease when the REW (◀◀) button is pressed. There are altogether 256 addresses, from 00 to FF.
   - Changing the data (Data setting)
     The data will increase when the PLAY (▶) button is pressed, and decrease when the STOP (■) button is pressed.
     There are altogether 256 data, from 00 to FF.
   - Writing the adjustment data
     It is necessary to press the PAUSE button to write the adjustment data (F page, D page) in the non-volatile memory.
     (The new adjustment data will not be recorded in the non-volatile memory if this operation is not performed.)
4) Select page: 6, address: 00, and adjust the data to 01. This releases the write protect of page F, and the camera section (F page) can be adjusted.
5) After completing all adjustments, turn off the main power (6.3V) once. This can release the adjustment mode (other than page F).

2. Precautions upon using the adjusting remote control unit

The correct adjustment data may be erased at times, due to operation errors of the adjusting remote control unit. To prevent this from occurring, it is recommended that all adjustment data be recorded in the memory before beginning adjustments, and the new adjustment data be recorded in the memory after each adjustment.

7-1-5. Page F Address List

Note 1: The data listed in the adjustment data memo column are fixed values.

Note 2: The adjustment data initial values are the values after performing "Page F Data Initialization" and "Page F Data Modification". They are different from the value after performing all the adjustments.

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	ID	Set ID	00	3B
01	FADER LEVEL	AE REF level modification during fader	E0	E0
02	FADER ENDTIM	The setting of the AE REF modulation time during fader	10	10
03	CS SL	Carrier balance adjustment	35	
04	VSUB	CCD imager V SUB adjustment [IC702 ③]	80	
05	VPGH	CCD imager VRG adjustment [IC702 ④]	80	
06	VREF Y	Camera core Y D/A standard voltage, SYNC level adjustment [IC702 ⑤]	7B	
07	VREF C	Camera core CHROMA D/A standard voltage, BURST level adjustment [IC702 ⑥]	99	
08	HALL GAIN	Hole amplifier gain adjustment [IC702 ⑦] HALL adjustment	47	
09	HALL OFFSET	Hole amplifier offset adjustment [IC702 ⑧]	71	
0A	E LOWLIGHT START	Low luminance intensity REF level modulation start setting	30	30
0B	REF 2V	2V standard voltage for hole element [IC702 ⑫]	68	68
0C	AD REF	Black level setting during A/D conversion, A/D off set adjustment [IC702 ⑬]	72	
0D	CORE DETH	CCD correction control	04	04
0E	CORE VTR DELAY	1HDL longitudinal setting during VTR playback	16	16
0F	CORE APCN4	Horizontal aperture setting	A5	A5
10	CORE APCN5	Vertical aperture setting	3D	3D
11	CORE EFECT	Special effect control	A0	A0
12	CORE MATR	BLUE matrix constant	27	27
13	CORE MATB	RED matrix constant	6C	6C
14	CORE BURST LEVEL	Burst flag level setting, color modulation ON/OFF Data Adjustment modeAdjustment 38 Normal level 2E Color modulation stopped	38	38
15	CORE CHROMA DLY	Y/C delay adjustment	03	03
16	CORE Y SETUP	Set up level setting	03	03
17	CORE VHAPCN	Slice and level setting of the aperture signal	17	17
18	CORE B-Y GAIN	B–Y GAIN Color reproduction adjustments	13	
19	CORE R-Y GAIN	R–Y GAIN	11	
1A	CORE R-Y HUE	R–Y HUE	FF	
1B	CORE B-Y HUE	B–Y HUE	FD	
1C	CS/APCCUT	Low luminance intensity aperture and chroma suppress level	22	22

Table 7-2 (1).

Address	Name	Function [ ] indicate the adjustment voltage output terminal		Adjustment data	
				Initial value	Memo column
1D	NEXT LINE DEFECT BIT	CCD correction pattern	CCD imager correction data write	00	
1E	CCD DEFECT0	CCD correction data		00	
1F	CCD DEFECT1	CCD correction data		00	
20	CCD DEFECT2	CCD correction data		00	
21	CCD DEFECT3	CCD correction data		00	
22	CCD DEFECT4	CCD correction data		00	
23	CCD DEFECT5	CCD correction data		00	
24	CCD DEFECT6	CCD correction data		00	
25	CCD DEFECT7	CCD correction data		00	
26	CCD DEFECT8	CCD correction data		00	
27	CCD DEFECT9	CCD correction data		00	
28	CCD DEFECT10	CCD correction data		00	
29	CCD DEFECT11	CCD correction data		00	
2A	CCD DEFECT12	CCD correction data		00	
2B	CCD DEFECT13	CCD correction data		00	
2C	CCD DEFECT14	CCD correction data		00	
2D	RREF L	3200k Red standard data LSB	Auto white balance preset adjustment	72	
2E	RREF H	3200k Red standard data MSB		5F	
2F	GREF L	3200k Green standard data LSB		D4	
30	GREF H	3200k Green standard data MSB		63	
31	BREF L	3200k Blue standard data LSB		3B	
32	BREF H	3200k Blue standard data MSB		2C	
33	RCONTREF	3200k RCONT adjustment value	Pre-white balance adjustment	42	
34	BCONTREF	3200k BCONT adjustment value		4A	
35	AWB NOWM R	Red regular correction coefficient	Auto white balance adjustment	7E	
36	AWB NORM B	Blue regular correction coefficient		96	
37	AWB SHUT IN	Indoor determination shutter data		A8	A8
38	ABW SHUT OUT	Outdoor determination shutter data		A0	A0
39	AWB IRIS IN	Indoor determination hole data	IRIS IN/OUT adjustment	79	
3A	AWB IRIS OUT	Outdoor determination hole data		7F	
3B	AWB G LEVEL	High luminance section green integral level		02	02
3C	AWB G WIDTH	High luminance section green integral level range		03	03
3D	DMAT HUE	Variable linear matrix HUE coefficient	Linear matrix adjustment	00	
3E	DMAT GAIN	Variable linear matrix GAIN coefficient		00	
3F	AWB SELECT	AWB mode selection		00	00
40	AWB DIFF	Standard difference from the outdoor fixed value		0A	0A
41	AWB BOTTOM SLP R	AWB incoming frame bottom R coefficient		48	48
42	AWB BOTTOM SLP B	AWB incoming frame bottom B coefficient		78	78
43	AWB MIDDLE SLP R	AWB incoming frame middle R coefficient		60	60
44	AWB MIDDLE SLP B	AWB incoming frame middle B coefficient		40	40
45	AWB TOP SLP R	AWB incoming frame top R coefficient		66	66
46	AWB TOP SLP B	AWB incoming frame top B coefficient		18	18
47	AWB KEIKO R	AWB incoming frame fluorescent light R coefficient		66	66
48	AWB KEIKO B	AWB incoming frame fluorescent light B coefficient		18	18
49	AWB BOTTOM UP	AWB incoming frame bottom upper value		C2	C2

Table 7-2 (2).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] Indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>4A</td><td>AWB BOTTOM DWN</td><td>AWB incoming frame bottom lower value</td><td>8C</td><td>8C</td></tr>
<tr><td>4B</td><td>AWB MIDDLE UP</td><td>AWB incoming frame middle upper value</td><td>AD</td><td>AD</td></tr>
<tr><td>4C</td><td>AWB MIDDLE DWN</td><td>AWB incoming frame middle lower value</td><td>96</td><td>96</td></tr>
<tr><td>4D</td><td>AWB TOP UP</td><td>AWB incoming frame top upper value</td><td>78</td><td>78</td></tr>
<tr><td>4E</td><td>AWB TOP DWN</td><td>AWB incoming frame top lower value</td><td>60</td><td>60</td></tr>
<tr><td>4F</td><td>AWB KEIKO</td><td>AWB incoming frame fluorescent light output lower value</td><td>66</td><td>66</td></tr>
<tr><td>50</td><td>AWB KEIKO DWN</td><td>AWB incoming frame fluorescent light lower value</td><td>59</td><td>59</td></tr>
<tr><td>51</td><td>AWB R TOP LMT</td><td>AWB incoming frame Rcont upper value</td><td>6E</td><td>6E</td></tr>
<tr><td>52</td><td>AWB R DWN LMT</td><td>AWB incoming frame Rcont lower value</td><td>20</td><td>20</td></tr>
<tr><td>53</td><td>AWB B TOP LMT</td><td>AWB incoming frame Bcont upper value</td><td>83</td><td>83</td></tr>
<tr><td>54</td><td>AWB B IN TOP</td><td>AWB incoming frame Bcont</td><td>67</td><td>67</td></tr>
<tr><td>55</td><td>AWB B IN MAX</td><td>AWB incoming frame Bcont</td><td>5C</td><td>5C</td></tr>
<tr><td>56</td><td>AWB B OUT MIN</td><td>AWB incoming frame Bcont</td><td>5C</td><td>5C</td></tr>
<tr><td>57</td><td>AWB B OUT DWN</td><td>AWB incoming frame Bcont</td><td>4A</td><td>4A</td></tr>
<tr><td>58</td><td>AWB B DWN LMT</td><td>AWB incoming frame Bcont lower value</td><td>1B</td><td>1B</td></tr>
<tr><td>59</td><td>AWB LL LMT</td><td>Low luminance intensity limiter</td><td>06</td><td>06</td></tr>
<tr><td>5A</td><td>AWB T M DIVID</td><td>AWB incoming frame upper, middle border value</td><td>5E</td><td>5E</td></tr>
<tr><td>5B</td><td>AWB B M DIVID</td><td>AWB incoming frame middle, lower border value</td><td>39</td><td>39</td></tr>
<tr><td>5C</td><td>AWB DELAY TM</td><td>AWB tracking speed
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>01</td><td>High speed tracking mode</td></tr>
<tr><td>0A</td><td>Normal</td></tr>
</table></td><td>0A</td><td>0A</td></tr>
<tr><td>5D</td><td>AWB FAST TM</td><td>AWB initial high speed tracking amount</td><td>40</td><td>40</td></tr>
<tr><td>5E</td><td>AWB OUT HYS OFF</td><td>AWB outdoor hysteresis off difference</td><td>0C</td><td>0C</td></tr>
<tr><td>5F</td><td>AWB OUT B HYS</td><td>AWB outdoor hysteresis amount</td><td>06</td><td>06</td></tr>
<tr><td>60</td><td>AWB MODE</td><td>AWB adjustment mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Normal</td></tr>
<tr><td>D0</td><td>AWB adjustment mode</td></tr>
<tr><td>F1</td><td>Sampling display mode</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>61</td><td>AE REFL</td><td>Reference value (lower) for AE</td><td>00</td><td>00</td></tr>
<tr><td>62</td><td>AE REFH</td><td>Reference value (upper) for AE</td><td>18</td><td>18</td></tr>
<tr><td>63</td><td>AGC MIN</td><td>AGC MIN value (AGCREF value), IRIS level adjustment</td><td>E3</td><td></td></tr>
<tr><td>64</td><td>AE MIML</td><td>Low luminance intensity side limiter (MAXGAIN), MAX GAIN adjustment</td><td>32</td><td></td></tr>
<tr><td>65</td><td>AE MAXL</td><td>High luminance intensity side limiter (lower)</td><td>80</td><td>80</td></tr>
<tr><td>66</td><td>IRIS OFFSET</td><td>Iris ROM table OPEN side off set</td><td>D0</td><td>D0</td></tr>
<tr><td>67</td><td>AE KEISU</td><td>Correction coefficient during detection weighting</td><td>00</td><td>00</td></tr>
<tr><td>68</td><td>AE FUNCTION</td><td>SW for turning each AE function ON and OFF</td><td>02</td><td>02</td></tr>
<tr><td>69</td><td>BL HOSEIH</td><td>Forcible back light level setting (upper)</td><td>40</td><td>40</td></tr>
<tr><td>6A</td><td>JITEISU DOWN</td><td>Constant during loop response DOWN side</td><td>28</td><td>28</td></tr>
<tr><td>6B</td><td>JITEISU UP</td><td>Constant during loop response UP side</td><td>0D</td><td>0D</td></tr>
<tr><td>6C</td><td>AE KNEE</td><td>KNEE setting value for AE</td><td>FF</td><td>FF</td></tr>
<tr><td>6D</td><td>ORETEN SET</td><td>Variable point due to time constant error amount</td><td>13</td><td>13</td></tr>
</table>

Table 7-2 (3).

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
6E	OMOMIOUT	Outer frame weighting amount	40	40
6F	AFC WIDE	Coefficient required for the ANF integral loop	03	03
70	AFC GAIN	Loop gain of the flickerless loop	01	01
71	AFC LIMIL	Limiter corresponding to the error rate (Lower)	60	60
72	HIST P KEISU	Histocomp level setting P for counter light determination	20	20
73	HIST H KEISU	Histocomp level setting H for counter light determination	E0	E0
74	HIST L KEISU	Histocomp level setting L for counter light determination	90	90
75	GYKOU JITEISU	Constant during auto back light response	08	08
76	SUBN LIMIT	Limiter for counter light determination	40	40
77	FUZZY RULE1	Correction amount 1 for auto back light	90	90
78	FUZZY RULE2	Correction amount 2 for auto back light	C0	C0
79	FUZZY RULE3	Correction amount 3 for auto back light	B0	B0
7A	FUZZY RULE4	Correction amount 4 for auto back light	A0	A0
7B	FUZZY RULE5	Correction amount 5 for auto back light	70	70
7C	FUZZY RULE6	Correction amount 6 for auto back light	80	80
7D	FUZZY RULE7	Correction amount 7 for auto back light	A0	A0
7E	FUZZY RULE8	Correction amount 8 for auto back light	98	98
7F	FUZZY RULE9	Correction amount 9 for auto back light	90	90
80	FUZZY RULE10	Correction amount 10 for auto back light	78	78
81	IRIS MIN L	Iris limit value for small iris (Lower)	80	80
82	IRIS MIN H	Iris limit value for small iris (Upper)	02	02
83	DELTA SHUTGAIN	Smoothing amount setting	04	04
84	AE WAKUH	Frame data for AE detection (vertical line)	0F	0F
85	AE WAKUV	Frame data for AE detection (horizontal line)	4F	4F
86	WIDE LIMIT	ZOOM limiter WIDE (lower) Flange back adjustment	00	
87	WIDE LIMITH	ZOOM limiter WIDE (upper)	00	
88	TELE LIMIT	ZOOM limiter TELE (lower)	00	
89	TELE SIMITH	ZOOM limiter TELE (upper)	04	
8A	STEP ZERO	Flange back value	80	
8B	STEP ZERO SPAN (VAP ONLY)	Flange back value 2	00	00
8C	ZOOM SPD FAST	Zoom speed (fast)	1C	1C
8D	ZOOM SPD SUPER	Zoom speed (For adjustment)	89	89
8E	ZS INIT SLOW	Zoom speed initial value (slow)	89	89
8F	ZS INIT FAST	Zoom speed initial value (fast)	F0	F0
90	ZMSPD DAMIN	Zoom speed D/A MIN value	3D	3D
91	ZS K	Zoom servo coefficient K	12	12
92	ZS L	Zoom servo coefficient L	02	02
93	ZP HYS	Zoom potential hysteresis	05	05
94	MOTOR ABILITY	Step motor MAX SPEED	08	08
95	AF MD2THL	MODE2 THR	20	20
96	MAXCHG THR	MAX value renewal THR	1A	1A
97	ERR THL	Wobbling width THR	18	18
98	WOB INTV	Wobbling second interval	04	04
99	ERRPOL THR	MODE2 error possible THR	13	13

Table 7-2 (4).

<table>
<tr><th rowspan="2">Address</th><th rowspan="2">Name</th><th rowspan="2">Function
[ ] indicate the adjustment voltage output terminal</th><th colspan="2">Adjustment data</th></tr>
<tr><th>Initial value</th><th>Memo column</th></tr>
<tr><td>9A</td><td>MAXCHK THR</td><td>MAX CHECK THR</td><td>12</td><td>12</td></tr>
<tr><td>9B</td><td>REWOB THR</td><td>Wobbling second THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9C</td><td>MODE2 INOUT</td><td>MODE2 speed switchover</td><td>80</td><td>80</td></tr>
<tr><td>9D</td><td>SMLWD THR</td><td>Small frame THR</td><td>0A</td><td>0A</td></tr>
<tr><td>9E</td><td>ZOOM PULSE LIMIT</td><td>Maximum zoom pulse value</td><td>F0</td><td>F0</td></tr>
<tr><td>9F</td><td>ZOOM RIZE</td><td>Zoom rise minimum speed time</td><td>0A</td><td>0A</td></tr>
<tr><td>A0</td><td>FB CURVEPEAKL</td><td>Constant for flange back adjustment</td><td>00</td><td>00</td></tr>
<tr><td>A1</td><td>FB CURVEPEAKH</td><td>Constant for flange back adjustment</td><td>72</td><td>72</td></tr>
<tr><td>A2</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>D2</td><td>D2</td></tr>
<tr><td>A3</td><td>FB ZOOMSH</td><td>Constant for flange back adjustment</td><td>03</td><td>03</td></tr>
<tr><td>A4</td><td>LIMITREST WIDE</td><td>Zoom limiter WIDE side</td><td>10</td><td>10</td></tr>
<tr><td>A5</td><td>LIMITREST TELE</td><td>Zoom limiter TELE side</td><td>10</td><td>10</td></tr>
<tr><td>A6</td><td>FB PEAKTHR</td><td>Constant for flange back adjustment</td><td>80</td><td>80</td></tr>
<tr><td>A7</td><td>FB FOCUSZERO</td><td>Constant for flange back adjustment</td><td>D8</td><td>D8</td></tr>
<tr><td>A8</td><td>DET IRIS ALT</td><td>Iris variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>A9</td><td>DET AGC ALT</td><td>AGC variation check THR</td><td>02</td><td>02</td></tr>
<tr><td>AA</td><td>LIMIT INSURANCE</td><td>Focus limiter insurance value</td><td>05</td><td>05</td></tr>
<tr><td>AB</td><td>FOCUS MODE</td><td>Focus mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>08</td><td>Zoom, Focus fixed</td></tr>
<tr><td>00</td><td>Normal</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AC</td><td>LENS ADJ MOD</td><td>Flange back adjustment mode
<table>
<tr><th>Data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Nomal</td></tr>
<tr><td>01</td><td>Flange back adjustment</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>AD</td><td>ELENS EMRG</td><td>Lens emergency</td><td>00</td><td>00</td></tr>
<tr><td>AE</td><td>NTSC PAL/H DEF</td><td>DELAY bit=0: NTSC, 1: PAL, bit4-7=CCD correction delay</td><td>21</td><td>21</td></tr>
<tr><td>AF</td><td>FT SW</td><td>DDS display mode switchover
<table>
<tr><th>Data</th><th>DDS display mode</th></tr>
<tr><td>00</td><td>Y sampling display</td></tr>
<tr><td>03</td><td>R-Y, B-Y display</td></tr>
<tr><td>40</td><td>HALL data display</td></tr>
<tr><td>82</td><td>R ratio display</td></tr>
<tr><td>83</td><td>b ratio display</td></tr>
<tr><td>91</td><td>R.B ratio (M) display</td></tr>
<tr><td>B0</td><td>Focus step display</td></tr>
</table></td><td>00</td><td>00</td></tr>
<tr><td>B0</td><td>CORE OTHER</td><td></td><td>10</td><td>10</td></tr>
<tr><td>B1</td><td>CORE YGAIN</td><td>Core field data 0 byte gain</td><td>3A</td><td>3A</td></tr>
<tr><td>B2</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B3</td><td></td><td></td><td></td><td></td></tr>
<tr><td>B4</td><td>ZOOM DROP 1</td><td>F-No. dropping (1) by zoom lens</td><td>00</td><td>00</td></tr>
<tr><td>B5</td><td>ZOOM DROP 2</td><td>F-No. dropping (2) by zoom lens</td><td>95</td><td>95</td></tr>
</table>

Table 7-2 (5).

Address	**Name**	**Function** **[ ] indicate the adjustment voltage output terminal**	**Adjustment data**	
			Initial value	**Memo column**
B6				
B7				
B8				
B9				
BA	AWB in B hys	AWB indoor hysteresis amount (B)	04	04
BB	AWB in R hys	AWB indoor hysteresis amount (R)	02	02
BC				
BD				
BE	MF STEP CHNGE	MODE 2 THR coefficient	06	06
BF	ZOOM SPEED SUPER SLOW	Zoom speed (Super slow speed)	08	08
C0	ZOOM INT SUPER SLOW	Zoom speed initial value (Super low speed)	89	89
C1	AF CONTROL FLAG		2C	2C
C2	AE Y THR	Low luminous intensity AE Y THR1	40	40
C3	AE Y MIN	Low luminous intensity AE Y THR2	18	18
C4	MD2 SPD	Focus speed at MODE 2	41	41
C5	AE CHECK	THR for activating re-start up from MODE 7, 8	30	30
C6	LOWCON THR1	THR1 for judging LOW CON at MODE 2	10	10
C7	LOWCON THR2	THR2 for judging LOW CON at MODE 2	20	20
C8~EF		Not used		
F0		Input column of the unit ID No., etc. Not related to unit operations.	FF	
F1			FF	
F2			FF	
F3			FF	
F4			FF	
F5			FF	
F6			FF	
F7			FF	
F8			FF	
F9			FF	
FA			FF	
FB			FF	
FC			FF	
FD			FF	
FE			FF	
FF			FF	

Table 7-2 (6).

7-1-6. 6 Page, 1 Page Address List

The camera adjustment mode can be set by performing the following data settings at page: 6 or page: 1. (These page data can be set temporary, but when the main power (6.3V) is turned off, the original value (normal value) will be returned. Therefore, these adjustment modes can be released very simply by turning the main power off.)

(Example) The camera adjustment mode (window OFF) is set by setting data: 01 to page: 6, address: 00. The F page write protect will also be released.

1. Page 6

Address	Adjustment Mode	Data	Function
00	Camera adjustment mode	01 10 11	Camera adjustment mode (window OFF), F page write protect released Normal Camera adjustment mode (window ON), F page write protect released
01	Camera adjustment switch **Note:** To set this address adjustment mode, it is necessary to press the PAUSE button of the adjusting remote control unit after setting the data.	00 01 03 05 07 09 0B 0D 0F 11 13 15 1F	Normal IRIS OPEN, AGC HOLD IRIS CLOSE1, AGC HOLD IRIS CLOSE2, AGC MIN IRIS CLOSE3, AGC MAX ND0.5 SHUTTER (PAL=1/160, NTSC=1/190) ND0.8 SHUTTER (PAL=1/320, NTSC=1/380) AWB PRESET1: 3200K PRESET DATA take in WB 3200K PRESET: Indoor white balance mode AWB PRESET2: 3200K PRESET DATA take in ZOOM HUNTING1 ZOOM SPDSLOW ZOOM HUNTING2 ZOOM SPDFAST EEPROM PRE WRITE: Page F initial data write
05	Shutter mode	00 15	NTSC=1/60, PAL=1/50 NTSC=1/2000, PAL=1/2000
08	ZOOM speed SLOW/FAST	00 01 02 03	Normal ZOOM speed SLOW (10 second) ZOOM speed FAST (3.5 second) ZOOM speed SLOW (10 second)
09 ★	COMPLEATED FLAG	00 01	Camera Adjustment not completed Camera adjustment completed
11 ★	ROM VERSION	01 02 04	Camera micro processor ver1 Camera micro processor ver2, ver3 Camera micro processor ver4

Addresses with ★ are exclusively for reading.

Table 7-3.

2. Page 1

Address	Adjustment Mode	Data	Function
E6	VH address L		Title horizontal/vertical position (L)
E7	VH address H		Title horizontal/vertical position (H)

Table 7-4.

7-1-7. Adjustment Connector

Most of the measuring points for the camera section adjustment are concentrated on CN701 of the CS-37 board. Connect the oscilloscope and etc. via the measuring pin (J-6082-139-A). The following table lists the terminal numbers and the signal names of CN701.

Terminal Number	Signal Name	Terminal Number	Signal Name
1	EVER 5V	2	NC
3	ZOOM SW	4	CAM SI
5	$\overline{\text{CS ROM}}$	6	CAM SO
7	$\overline{\text{CS OPD}}$	8	$\overline{\text{CAM SCK}}$
9	$\overline{\text{CS CORE}}$	10	GND
11	IRIS OUT	12	NC
13	V SUB CHK	14	C OUT
15	PG CONT	16	GND
17	NC	18	Y OUT

Table 7-5.

7-1-8. Data Processing

The calculation of the DDS display and the adjusting remote control unit display data (hexadecimal notation) are required for obtaining the adjustment data of some adjustment items. In this case, after converting the hexadecimal notation to decimal notation, calculate and convert the result to hexadecimal notation, and use it as the adjustment data. Table 7-6. indicates the hexadecimal notation-the decimal notation calculation table.

Hexadecimal notation-Decimal notation

②

The lower digits of the hexadecimal notation / The upper digits of the hexadecimal notation	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	80	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A (A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
①→ **B (b)**	176	177	178	179	180	180	182	183	184	185	186	187	188	189	190	191
C (c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D (d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E (E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F (F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) indicate the adjusting remote control unit display.

(Example) In the case that the DDS display and the adjusting remote control unit display are BD (b d).
As the upper digit of the hexadecimal notation is B (b), and the lower digit is D (d), the intersection "189" of the ① and ② in the above table is the decimal notation to be calculated.

Table 7-6.

7-2. CAMERA SYSTEM ADJUSTMENT

1. Power Supply Voltage Check (PS-308 board)

Subject	Option
Measuring instrument	Digital voltmeter
D5V check	
Measurement point	Pins ⑰ and ⑱ of CN950
Specified value	4.98 ± 0.15 Vdc
D4V check	
Measurement point	Pins ⑮ and ⑯ of CN950
Specified value	4.03 ± 0.15 Vdc
CAM 5V check	
Measurement point	Pins ⑬ and ⑭ of CN950
Specified value	4.90 ± 0.15 Vdc
15V check	
Measurement point	Pin ⑪ of CN950
Specified value	15.04 ± 0.4 Vdc
-9V check	
Measurement point	Pin ⑫ of CN950
Specified value	-8.5 ± 0.4 Vdc

Checking method:

1) Check that each power supply voltage satisfies the specified value.

2. Page F Data Initialization

Note: It is necessary to perform all adjustments of the camera section from the beginning again if the data of page F has been initialized.

Initializing method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Check that the data of page: 6, address: 09 is 00.
   (Display indicating that page F data can be initialized)
3) Set data: 1D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Page F data initialization execution.
   The data of all addresses of page F will be initialized.)
4) Check that the data of page: 6, address: 09 is 01.
   (Displays that the initialization of page F data has been completed)
5) Set data: 00 to page: 6, address: 01. and press the PAUSE button of the adjusting remote control unit.
   (Releases the page F data initialization mode)
6) After performing "Page F data modification", perform all the adjustments of the camera section (page F).

3. Page F Data Modification

The data (initial data) that is automatically written on page F after the initialization of the page F data is different from the initial data for adjustment. Change the data by manual input, and arrange it.

Note: When changing the data, to write the data to the non-volatile memory, press the PAUSE button of the adjusting remote control unit every time the new data is set.

Address	Data
00 (ID)	3B
11 (CORE EFECT)	A0
14 (CORE BURST LEVEL)	38
15 (CORE CHROMA DLY)	03
16 (CORE Y SETUP)	03
5C (AWB DELAY TM)	0A
68 (AE FUNCTION)	02
6A (JITEISU DOWN)	28
6B (JITEISU UP)	0D
8C (ZOOM SPD FAST)	1C
8D (ZOOM SPD SUPER)	89
8E (ZS INIT SLOW)	89
8F (ZS INIT FAST)	F0
94 (ZOOM SPD SLOW)	08
9E (ZOOM PULSE LIMIT)	F0
AE (NTSC PAL/H DEF DELAY)	21
B0 (CORE OTHER)	10
B1 (CORE Y GAIN)	3A
BF (ZOOM SPEED SUPER SLOW)	08
C0 (ZOOM INT SUPER SLOW)	89

[Distinguishing the Camera Micro Computer (IC709) Versions]

The camera micro computer version can be distinguished by looking at the part name of the camera micro processor or the data of page: 6, address: 11.

Version	Part Name	Page: 6 Address: 11
Ver.5	CXP80624-299Q	05

4. 28 MHz Original Oscillation Adjustment (CS-37 board)

Subject	Not required
Measurement Point	CL821 (pin (57) of IC801)
Measuring Instrument	Frequency counter
Adjusting Element	CT801
Specified Value	14187500 ± 71 Hz

Adjusting method:

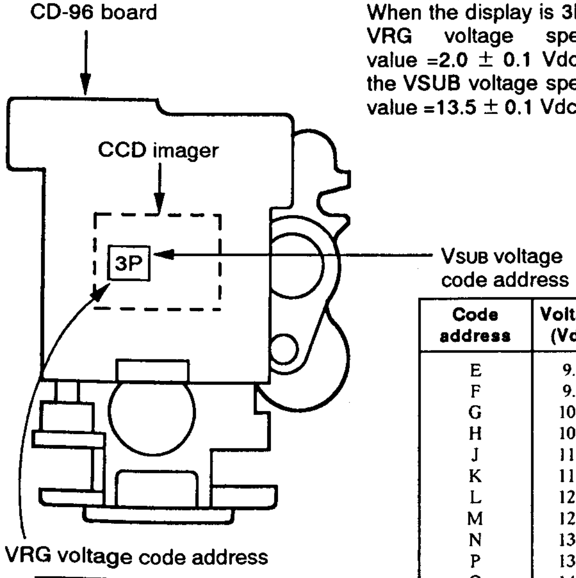
1) Use CT801 to adjust the oscillation frequency to 14187500 ± 71 Hz.

5. V SUB Adjustment (CS-37 board)

Subject	Not required
Measurement Point	Pin ⑬ of CN701 (V SUB CHK)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	04 (V SUB)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 04, and adjust the voltage of pin ⑬ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.



(Example)
When the display is 3P, the VRG voltage specified value =2.0 ± 0.1 Vdc, and the VSUB voltage specified value =13.5 ± 0.1 Vdc.

VRG voltage code address

Code address	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

VSUB voltage code address

Code address	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

Fig. 7-7.

6. VRG Adjustment (CS-37 board)

Subject	Not required
Measurement Point	Pin ⑮ of CN701 (PG CONT)
Measuring Instrument	Digital voltmeter
Adjustment Page	F
Adjustment Address	05 (VRG)
Specified Value	(Imager display voltage) ± 0.1 Vdc

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 05, and adjust the voltage of pin ⑮ of CN701 to (imager display voltage) ± 0.1 Vdc.
3) Press the PAUSE button of the adjusting remote control unit.

7. CCD Imager Correction Data Write

Subject	Not required
Adjustment Page	F
Adjustment	1D to 2C (CCD-DEFECT)

Perform CCD imager correction data write in the following cases.

1. When the CCD imager has been replaced
2. The ocassion of exchaning a camera micro processor or EEPROM (IC712).
3. When the page F data has been initialized

In the case of 1, as the correction data is not required for the CCD imager for repair, adjust all data of addresses 1D to 2C to "00".

In the case of 2 and 3, write the correction data attached to the shield case of PS-308 board to addresses 1D to 2C.

If the correction data are not attached, adjust all data of addresses 1D to 2C to "00".

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Write the correction data to page: F, addresses: 1D to 2C.
   Note: To perform write to the non-volatile memory, press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) If the CCD imager has been replaced, remove the old correction data label attached on the shield case (UPPER) of PS-308 board.

8. HALL Adjustment

Subject	Not required
Measurement Point	DDS display of EVF or monitor TV
Measuring Instrument	
Adjustment Page	F
Adjustment Address	08 (HALL GAIN) 09 (HALL OFFSET)
Specified Value	31 to 35 during IRIS OPEN B1 to B5 during IRIS CLOSE (Note 1) (2E to 32 during IRIS OPEN AD to B1 during IRIS CLOSE)

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL output display mode setting)
3) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
4) Set data: 40 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
5) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the monitor TV display), and set to W_2.
6) Set data: 30 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
7) Read the DDS display data, and set to W_1.
8) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS OPEN mode setting)
9) Read the DDS display data, and set to K_1.
10) Set data: 40 to page: F, address: 08, and press the PAUSE button.
11) Read the DDS display data, and set to K_2.
12) Convert W_1, W_2, K_1, K_2 to decimal notation, and obtain W_1', W_2', K_1', K_2'. (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table".)
13) Calculate X_1' using the following equations (decimal notation calculation).

$$A' = W_2' + K_1' - W_1' - K_2' \cdots\cdots \text{Equation 1}$$

$$B' = W_1' - K_1' \cdots\cdots \text{Equation 2}$$

$$X_1' = \frac{2048 + (48 \times A') - (16 \times B')}{A'} \cdots\cdots \text{Equation 3}$$

$$\left(X_1' = \frac{2032 + (48 \times A') - (16 \times B')}{A'} \cdots\cdots \text{Equation 3 (Note 1)} \right)$$

14) Convert X_1' to hexadecimal notation, and obtain X_1.
    (Round off to one decimal place)
15) Set data: X_1 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
16) Change the data of page: F, address: 09, and adjust the DDS display data to "33" ["30"]. (Note 1)
17) Press the PAUSE button of the adjusting remote control unit.
18) Set data: 03 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS CLOSE mode setting)
19) Read the DDS display data, and set to W_0. If W_0 lies within the "B1" ["AD"] to "B5" ["B1"] range, perform "Processing after completing adjustments". If it lies outside the range, perform the following adjustments. (Note 1)
20) Convert W_0 to decimal notation, and obtain W_0'.
21) Calculate X_2' using the following equations (decimal notation calculation).

$$C' = W_0' - B' - 51 \cdots\cdots \text{Equation 4}$$

$$X_2' = \frac{(128 - B') \times (X_1' - 48) + 48 \times C'}{C'} \cdots\cdots \text{Equation 5}$$

$$\left(X_2' = \frac{(127 - B') \times (X_1' - 48) + 48 \times C'}{C'} \cdots\cdots \text{Equation 5 (Note 1)} \right)$$

    (X_1' and B' are values obtained from equations 2 and3)
22) Convert X_2' to hexadecimal notation and obtain X_2.
    (Round off to one decimal place)
23) Set data X_2 to page: F, address: 08, and press the PAUSE button of the adjusting remote control unit.
24) Change the data of page: F, address: 09, and adjust the DDS display data to "B3".
25) Press the PAUSE button of the adjusting remote control unit.
26) Set data: 01 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
    (IRIS OPEN mode setting)
27) Check that the DDS display data lies within the "31" ["2E"] to "35" ["32"] range. (Note 1)

Processing after Completing Adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

Note 1: [ ] contains the specified value and constant when the following lens or board is used.

- The KOS type lens is used.
- The TAM type lens is used when the number of the CS-37 board ends with -11.

The lens type can be distinguished as follows.

1. Release the protect.
   Page: 6, address: 00, data: 01
2. Set data: 06 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Setting the lens data display mode)
3. The lens type can be distinguished according to the DDS display data.

DDS display data	Lens type
42	CAN or TAM
46	KOS

However, when the number of the CS-37 board ends with -11, the DDS display data of the TAM type lens will be "46".

9. Flange Back Adjustment

Subject	Chart for flange back adjustment (1000 ± 5 mm from the front side of the lens Luminance: 300 ± 50 lux)
Measurement Point	Check the operations on the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	86 (WIDE LIMIT), 87 (WIDE LIMIT H), 88 (TELE LIMIT), 89 (TELE LIMIT H), 8A (STEP ZERO)

Adjusting method:

1) Check that the flange back adjustment chart center and the exposure display center coincide at both zoom lens TELE end and WIDE end.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Check that the data of page: 6, address: 09 is 00.
   (Flange back adjustment possible display)
4) Check that the page: F, address: 86 to 8B data is at the initial value. (Refer to Table 7-2. "Page F address list")
5) Set data: 01 to page: F, address: AC.
   (This causes automatic adjustment to be performed. Adjustments are performed at the zoom lens TELE end first, and then at the WIDE end. The adjustment data is automatically input to page: F, addresses: 86 to 8A.)
6) Check that the data of page: 6, address: 09 is 01.
   (Display indicating flange back adjustment completion)

Processing after completing adjustments

1) Set data: 00 to page: F, address: AC.
2) Turn off the main power supply (6.3V).

10. Flange Back Check

Subject	Siemens star (1m from the front of the lens)
Measurement Point	DDS display of EVF or TV monitor
Measuring Instrument	
Specified Value	$D_2=D_1 \pm 5$ $D_4=D_3 \pm 5$

Checking method:

1) Set data: 11 to page: 6, address: 00. (Camera adjustment (Window ON) mode)
2) Set data: B0 to page: F, address: AF. (Focus step display mode)
3) Place the Siemens star 1m from the front of the lens.
4) To open the IRIS, decrease the luminous intensity to the Siemens star up to a point before noise appears on the image.
5) Turn off the auto-focus. (Note 1)

- Checking the flange back at the center point of the zoom.

6) Shoot the Siemens star with the zoom TELE end.
7) Adjust the focus. (Note 2)
8) Adjust to the center point of the zoom.
   (Adjust to the center point by viewing the EVF zoom position.)
9) Read the focus step value (4 digits) displayed on the TV monitor, and take the value as D_1.
10) Adjust the focus. (Note 2)
    Read the focus step value here, and take the value as D_2.
11) Check that $D_2=D_1 \pm 5$.

- Checking the flange back at the zoom WIDE end.

12) Shoot the Siemens star at the zoom TELE end.
13) Adjust the focus. (Note 2)
14) Adjust to the zoom WIDE edge.
15) Read the focus step value displayed on the TV monitor, and take the value as D_3.
16) Adjust the focus. (Note 2)
    Read the focus step value here, and adjust to D_4.
17) Check that $D_4=D_3 \pm 5$.

Process after checking

1) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.

Note 1: How to turn off the auto focus.

1) While pressing the PUSH FOCUS HOLD button, set the FOCUS HOLD switch to the HOLD position.

Note 2: How to adjust the focus when the auto focus off mode.

1) Set the HOLD switch of the adjusting remote control unit to the NORMAL position.
2) Adjust the focus with the manual focus bottons (👤 and ⛰) of the adjusting remote control unit.
3) Set the HOLD switch of the adjusting remote control unit to the ADJ (HOLD) position.

11. SYNC Level Adjustment (CS-37 board)

Subject	Not required
Measurement Point	Pin ⑱ of CN701 (Y OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	06 (VREF-Y)
Specified Value	A=150 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 06, and adjust so that the SYNC level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

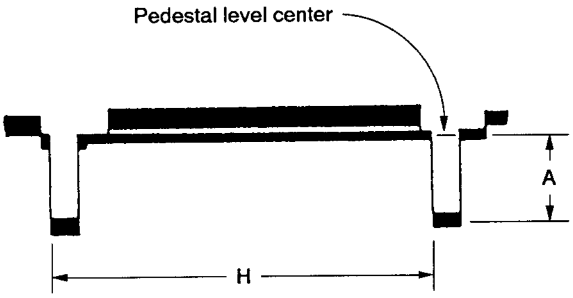


Fig. 7-8.

12. BURST Level Adjustment (CS-37 board)

Subject	Not required
Measurement Point	Pin ⑭ of CN701 (C OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	07 (VREF-C)
Specified Value	A=150 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE mode setting)
3) Change the data of page: F, address: 07, and adjust so that the burst level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of IRIS CLOSE mode)

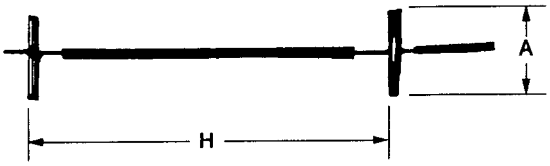


Fig. 7-9.

13. A/D Offset Adjustment

Subject	Not required
Measurement Point	DDS display on the EVF or the TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	0C (AD REF)
Specified Value	40 to 41

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE AGC MIN mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Y sampling output mode setting)
4) Set data: 00 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Sets the SET UP level to 0)
5) Set data: 35 to page: 1, address: E6.
   (Setting 1 of the sampling position)
6) Set data: 6D to page: 1, address: E7.
   (Setting 2 of the sampling position)
7) Change the data of page: F, address: 0C, and adjust the average value of the DDS display (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor display) to 40 to 41.
   (Set the data of address 0C to the maximum value satisfying the specification.)
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 03 to page: F, address: 16, and press the PAUSE button of the adjusting remote control unit.
   (Returns the SET UP level to the normal level.)
2) Turn the main power supply (6.3V) off.

14. Carrier Balance Adjustment

Subject	Not required
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	03 (CS SL)
Specified Value	The center of the black luminance point should lie within the 1 ϕ circle whose center is the principle point.

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01.
2) Set data: 05 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MIN mode setting)
3) Change the data of page: F, address: 03, and adjust so that the center of the black luminance point coincides with the principle point.
4) Press the PAUSE button of the adjusting remote control unit.
5) Set data: 07 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS CLOSE, AGC MAX mode setting)
6) Check that the center of the black luminance point is within the sppecified circle.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (IRIS NORMAL mode setting)

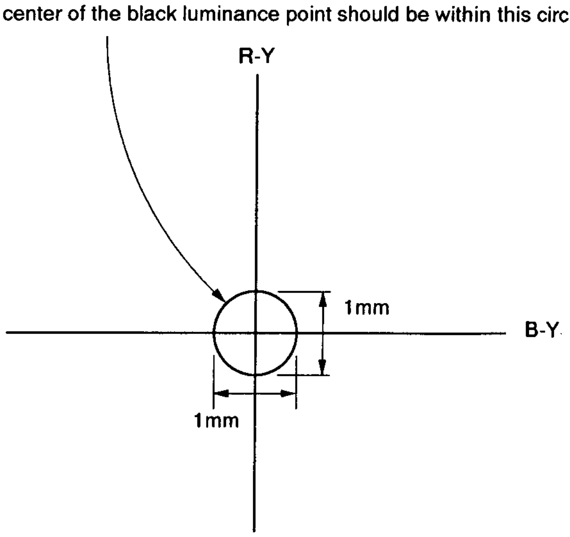

The center of the black luminance point should be within this circle
R-Y
1mm
B-Y
1mm

Fig. 7-10.

15. Picture Frame Setting

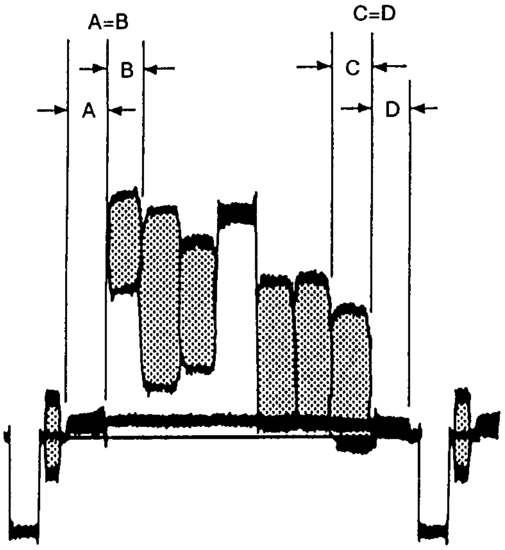
Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Oscilloscope and TV monitor.
Specified Value	A=B, C=D, t=0 ± 0.1 msec

Setting method:

1) Adjust the zoom and the camera direction, and set to the specified position.
2) Mark the position of the picture frame on the monitor display, and adjust the picture frame to this position in following adjustments using "color bar chart standard picture frame" and "white pattern standard picture frame".

Check on the oscilloscope

1. horizontal period



2. Vertical period

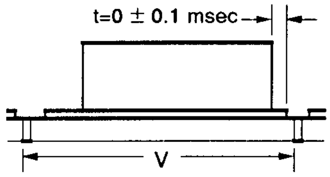


Fig. 7-11.

Check on the TV monitor

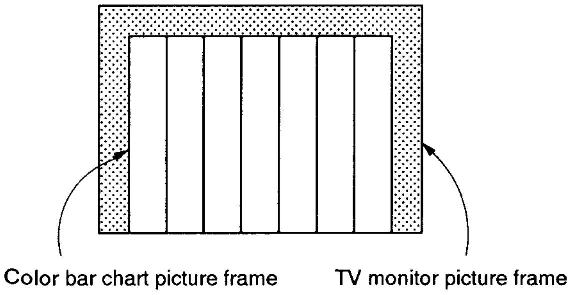

Color bar chart picture frame
TV monitor picture frame

Fig. 7-12.

16. IRIS Level Adjustment (CS-37 board)

Subject	Color bar standard picture frame
Measurement Point	Pin ⑪ of CN701 (IRIS OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	63 (AGC MIN)
Specified Value	A=220 ± 5 mV

Adjusting method:

1) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 63, and adjust so that the IRIS OUT signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

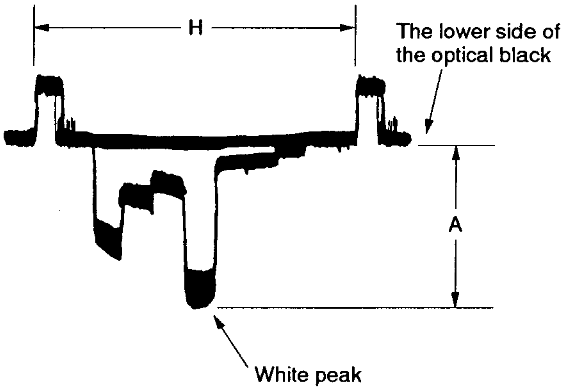

H
The lower side of the optical black
A
White peak

Fig. 7-13.

17. MAX GAIN Adjustment (CS-37 board)

Subject	Color bar standard picture frame
Filter	ND filter 1.0 (2 sheets) and 0.4 (1 sheet), 0.1 (1 sheet)
Measurement Point	Pin ⑱ of CN701 (CAM Y)
Measuring Instrument	Oscilloscope
Adjustment Page	F
Adjustment Address	64 (AE MIN L)
Specified Value	A=210 ± 5 mV

Adjusting method:

1) Place the ND filter 2.5 (1.0+1.0+0.4+0.1) on the lens.
2) Release the protect.
   Page: 6, address: 00, data: 01
2) Change the data of page: F, address: 64, and adjust so that the CAM Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

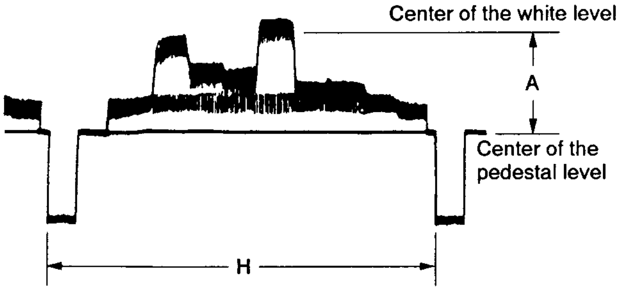


Fig. 7-14.

18. IRIS IN/OUT Adjustment

Subject	White pattern standard picture frame
Measurement Point	DDS display of the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	39 (AWB IRIS IN) 3A (AWB IRIS OUT)

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: 40 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (HALL data display)
3) Set data: 0B to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.8 shutter mode setting)
4) Read the DDS display data (the bottom two digits of the display data at the bottom right of the EVF or the TV monitor), and set to D39.
5) Set data: D39 to page: F, address: 39, and press the PAUSE button of the adjusting remote control unit.
6) Set data: 09 to page 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (ND0.5 shutter mode setting)
7) Read the DDS display data and set to D3A.
8) Set data: D3A to page: F, address: 3A, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the ND0.8 shutter mode)

19. Pre-white Balance Adjustment

Subject	White pattern standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	33 (R CONT REF), 34 (B CONT REF)
Specified Value	The center of the white luminance point should lie within the circle with a diameter of 1mm and whose center is the principle point

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (WB 3200K preset mode setting)
2) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
3) Change the data of addresses:33 and 34 of page: F alternately, and coincide the white luminance point to the principle point.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not written to the memory.
4) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

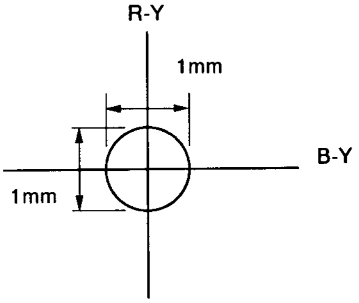


Fig. 7-15.

20. Color Reproduction Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Page	F
Adjustment Address	18 (CORE B–Y GAIN), 19 (CORE R–Y GAIN), 1A (CORE R–Y HUE), 1B (CORE B–Y HUE)
Specified Value	All color luminance points should settle within each color reproduction frame.

Adjusting method:

1) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Indoor white balance mode setting)
2) Set data: 01 to page: 6, address: 00.
   (Camera adjustment mode (Window OFF) setting)
3) Adjust the GAIN and PHASE of the vectorscope, and adjust the burst luminance point to the burst position of the color reproduction frame.
4) Change the data of addresses 18 to 1B of page: F, and settle each color luminance point in each color reproduction frame.
   Note: Be sure to press the PAUSE button of the adjusting remote control unit before changing the addresses.
   If not, the new data will not be written to the memory.
5) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01.
   (Release of the adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Protect mode setting)

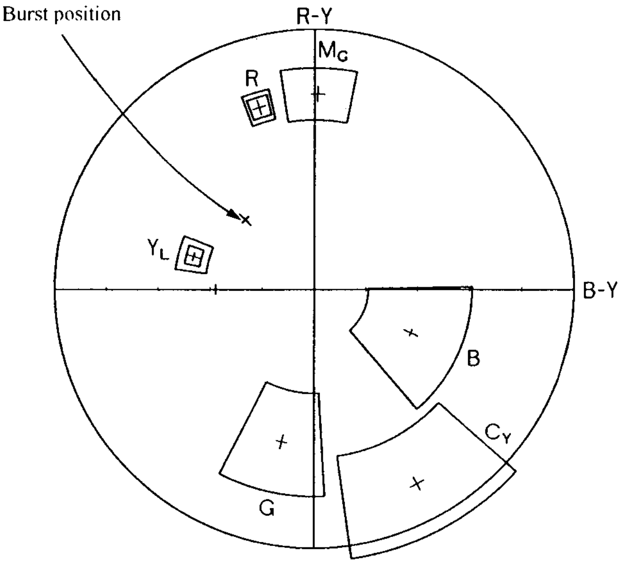


Fig. 7-16.

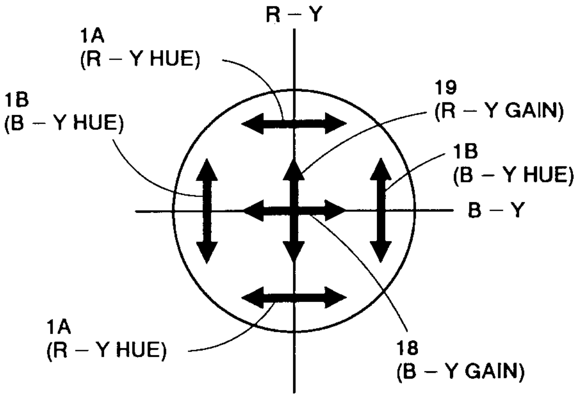


Fig. 7-17. Direction of the Movements of the Adjustment Address and Luminance Point

21. Auto White Balance Preset Adjustment

Subject	White pattern standard picture frame
Adjustment Page	F
Adjustment Address	2D (R REF L), 2E (R REF H), 2F (G REF L), 30 (G REF H), 31 (B REF L), 32 (B REF H)

Adjusting method:

1) Turn the power of the unit OFF/ON.
2) Check that the data of page: 6, address: 09 is 00.
   (Auto white balance preset adjustment possible display)
3) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
5) Set data: 11 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (3200K preset data take in preparation mode)
6) Set data: 0D to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (When the 3200K preset data is taken in, the data will be automatically input to addresses 2D to 32 of page F.)
7) Check that the data of page: 6, address: 09 is 01.
   (Auto white balance preset adjustment completion display)

Processing after completing adjustments

1) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
   (Release of the auto white balance preset mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

22. Auto White Balance Adjustment

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	Check with the DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	35 (AWB NORM R) 36 (AWB NORM B)
Specified Value	R ratio 2980 ± 40 B ratio 5C80 ± 40

Note: Check that "Auto white balance preset adjustment" has been completed.

Adjusting method:

1) Set data: 11 to page: 6, address: 00.
   (Camera adjustment mode (Window ON) setting)
2) Set data: D0 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Auto white balance adjustment mode setting)
3) Set data: 82 to page: F, address: AF.
   (R ratio display mode setting)
4) Change the data of page: F, address: 35, and adjust the average value of the DDS display data (the display data at the bottom right of the EVF or the TV monitor) to 2980 ± 40.
5) Press the PAUSE button of the adjusting remote control unit.
6) Set data: 83 to page: F, address: AF.
   (B ratio display mode setting)
7) Change the data of page: F, address: 36, and adjust the average value of the DDS display data to 5C80 ± 40.
8) Press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the white balance adjustment mode)
2) Set data: 10 to page: 6, address: 00.
   (Release of camera adjustment mode)

23. White Balance Check

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction ND filter 1.0 and 0.3
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Specified Value	Fig. 7-18. A to C

Checking method:

1) Check that the lens is not covered with either filter.
2) Set data: 11 to page: 6, address: 00.
(Camera adjustment mode (Window ON) setting)
3) Set data: 0F to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Indoor white balance mode setting)
4) Check that the center of the white luminance point is within the circle shown in Fig. 7-18.A.
(Indoor white balance check)
5) Set data: 00 to page: 6, address: 01, and press the PAUSE button of the adjusting remote control unit.
(Auto white balance mode setting)
6) Set data: 01 to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
(Auto white balance high speed tracking mode setting)
7) Set data: 91 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(R, B ratio (M) display mode setting)
8) Check that the top 2 digits and the bottom 2 digits of the DDS display are 3D to 43.
9) Check that the center of the white luminance point is within the circle shown in Fig. 7-18. A.
10) Place the C14 filter on the lens.
11) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. B.
(Auto white balance outdoor mode check)
12) Remove the C14 filter, and place the ND filter 1.3 (1.0+0.3) on the lens.
13) Check that the center of the white luminance point settles in the circle shown in Fig. 7-18. C.
(Auto white balance outdoor mode check)

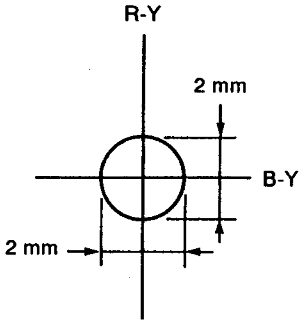


Fig. 7-18. A

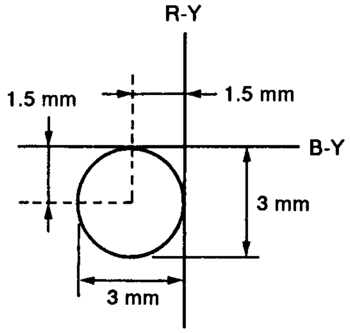


Fig. 7-18. B

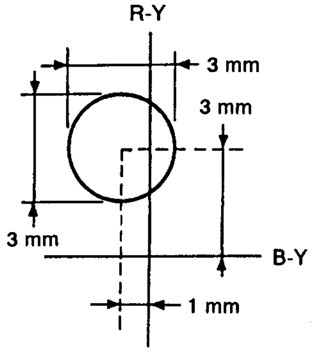


Fig. 7-18. C

Processing after completing adjustments

1) Set data: 0A to page: F, address: 5C, and press the PAUSE button of the adjusting remote control unit.
(Release of the auto white balance fast tracking mode)
2) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
(Release of the R, B ratio (M) display mode)
3) Set data: 10 to page: 6, address: 00.
(Release of camera adjustment mode)

24. Linear Matrix Adjustment

Subject	Color bar standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	DDS display on the EVF or TV monitor
Measuring Instrument	
Adjustment Page	F
Adjustment Address	3D (DMAT HUE) 3E (DMAT GAIN)

Note 1: Check that position that was set in the color bar chart picture frame "15. Picture Frame Setting" is maintained, before beginning adjustments.

Adjusting method:

1) Remove the filter C14 for color temperature correction.
2) Release the protect.
   Page: 6, address: 00, data: 01
3) Color bar data sampling mode setting
   1. Check that the data of page: 6, address: 01 is 00.
   2. Set data: F1 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   3. Set data: 2E to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.

   (Check that the colors on the monitor display at the color modulation stop mode have disappeared)
4) Specifying the Yellow position
   1. Set data: C9 to page: 1, address: E6.
   2. Set data: B6 to page: 1, address: E7.
5) Set data: 03 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (R–Y•B–Y data display mode setting)
6) Read the average value of the DDS display R–Y data (Note 2), and set to Y_1.
7) Specifying the Red position
   1. Set data: 59 to page: 1, address: E6.
   2. Set data: 6D to page: 1, address: E7.
8) Read the average value of the DDS display B–Y data (Note 2), and set to R_1.
9) Place the filter C14 for color temperature correction on the lens. (Ensure that the picture frame of the chart does not shift at this time.)
10) Specifying the yellow position.
    1. Set data: C9 to page: 1, address: E6.
    2. Set data: B6 to page: 1, address: E7.
11) Read the average value of the DDS display R–Y data (Note 2), and set to Y_2.
12) Convert Y_1, R_1, Y_2 to decimal notation to obtain Y_1', R_1' and Y_2'.
    (Refer to Table 7-6. "Hexadecimal notation-decimal notation conversion table")
13) Calculate X_1' from the following equation (decimal notation calculation).
    $X_1'=Y_2'-Y_1'$
14) Calculate D3D from the following table
    (D3D is hexadecimal notation)

X_1' value	D3D
$-1 \leqq X_1' \leqq 1$	F0
$X_1'>1$	F1
$X_1'<-1$	FF

15) Set data: D3D to page: F, address: 3D, and press the PAUSE button of the adjusting remote control unit.
16) Specifying the Red position
    1. Set data: 59 to page: 1, address: E6.
    2. Set data: 6D to page: 1, address: E7.
17) Read the average value of the DDS display B–Y data (Note 2), and set to R_2.
18) Convert R_2 to decimal notation to obtain R_2'.
19) Calculate X_2' from the following equation (decimal notation calculation).
    $X_2'=R_2'-R_1'$
20) Calculate D3E from the following table.

X_2' value	D3E
$X_2' \geqq 0$	00
$0>X_2' \geqq -1$	01
$-1>X_2'$	02

21) Set data: D3E to page: F, address: 3E, and press the PAUSE button of the adjusting remote control unit.

Processing after completing adjustments

1) Set data: 00 to page: F, address: 60, and press the PAUSE button of the adjusting remote control unit.
   (Release of the sampling mode)
2) Set data: 38 to page: F, address: 14, and press the PAUSE button of the adjusting remote control unit.
   (Color modulation ON mode setting)
3) Set data: 00 to page: F, address: AF, and press the PAUSE button of the adjusting remote control unit.
   (Release of the R–Y•B–Y data display mode)
4) Turn the main power supply (6.3V) off.

Note 2: As the R–Y data and B–Y data are displayed alternatively, it will be difficult to distinguish between the R–Y data and the B–Y data.
Record this data on a tape, and perform frame advancing playback so that only the R–Y data or the B–Y data is read.
(Example)
If the frame advancing playback is performed, the following will be displayed.

$$63\underline{88} \rightarrow \underline{8B}61 \rightarrow 61\underline{8B} \rightarrow \underline{8A}63 \rightarrow$$
$$65\underline{89} \rightarrow \underline{8B}60 \rightarrow 60\underline{8A} \rightarrow \underline{89}63$$

As the R–Y data is above 80, and the B–Y data is below 7F, the data which is underlined is the R–Y data . If the average value is calculated, the R–Y data will become 8A and the B–Y data will becames 62.

25. VIDEO OUT Level Check

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal (Terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Specified Value	Y level=680 ± 40 mV SYNC level=300 ± 20 mV BURST level=300 ± 30 mV

Checking method:

1) Check that the Y level, SYNC level and BURST level satisfy the specified values.

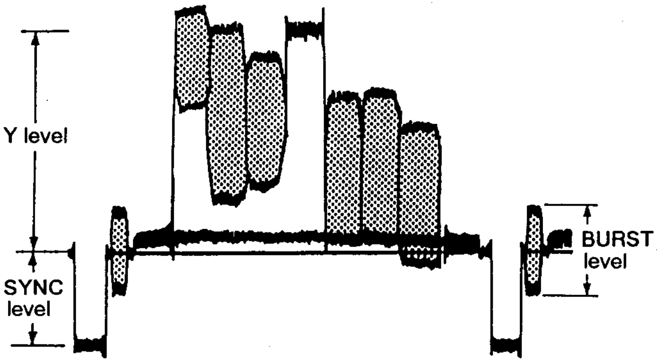


Fig. 7-19.

7-3. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-44 BOARD)

7-3-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-21.

Adjustment method:

1) Adjust RV503 (BRIGHT) for appropriate brightness on CRT screen.
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-20.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

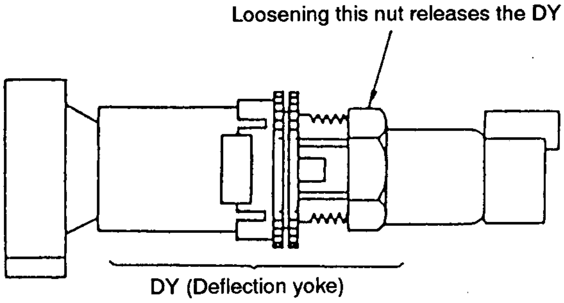
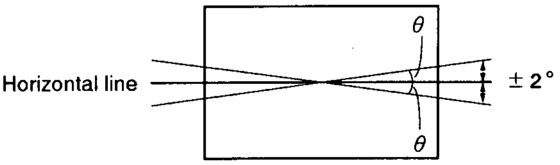


Fig. 7-20.



Specified value: Image orientation within ± 2° of horizontal line.

Fig. 7-21.

7-3-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-23.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-22.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

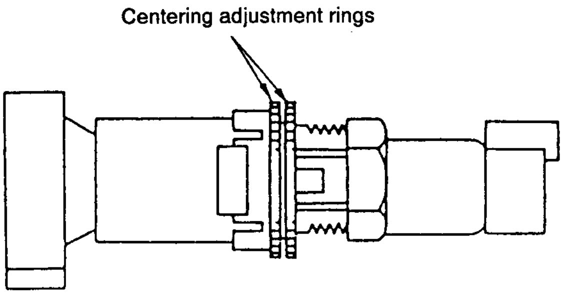


Fig. 7-22.

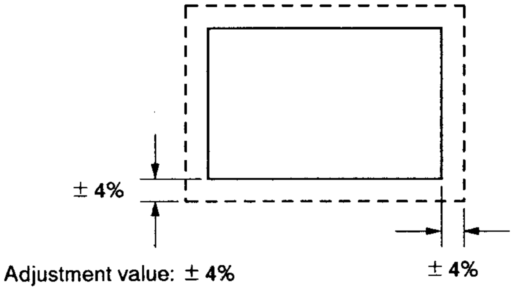


Fig. 7-23.

7-3-3. AFC Adjustment (VF-44 Board)

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C517 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV504 (AFC)
Specified Value	2.3 ± 0.1 Vdc

Adjustment method:

1) Adjust RV504 (AFC) for 2.3 ± 0.1 Vdc.

7-3-4. Horizontal Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C504
Specified Value	6 ± 3%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by RV505 (V SIZE).
2) Rotate RV503 (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C504) to provide horizontal overscans of 6 ± 3% (total of left and right). (See Fig. 7-25.)

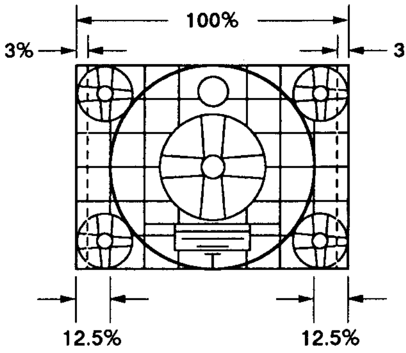
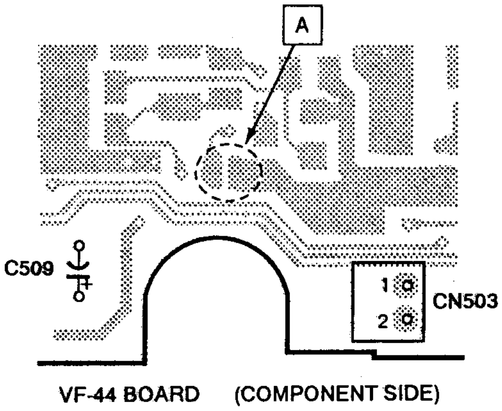


Fig. 7-24.



A section	H size
Short	Large
Open	Small

Fig. 7-25.

7-3-5. Vertical Amplitude Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV505 (V SIZE)
Specified Value	6 ± 3%

Adjustment method:

1) By turning RV505 (V SIZE), adjust vertical overscan to 6 ± 3% (upper and lower total).

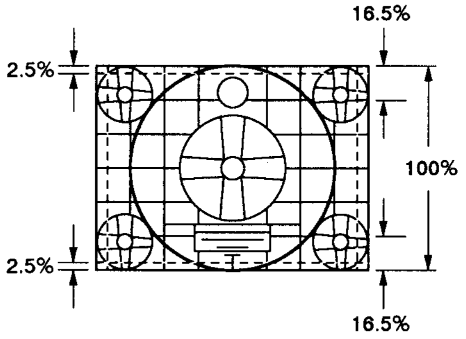


Fig. 7-26.

7-3-6. Focus Adjustment (VF-44 Board)

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV502 (FOCUS)

Adjustment method:

1) Adjust to the best focus point with RV502.

7-3-7. Brightness, Contrast Adjustments (VF-44 Board)

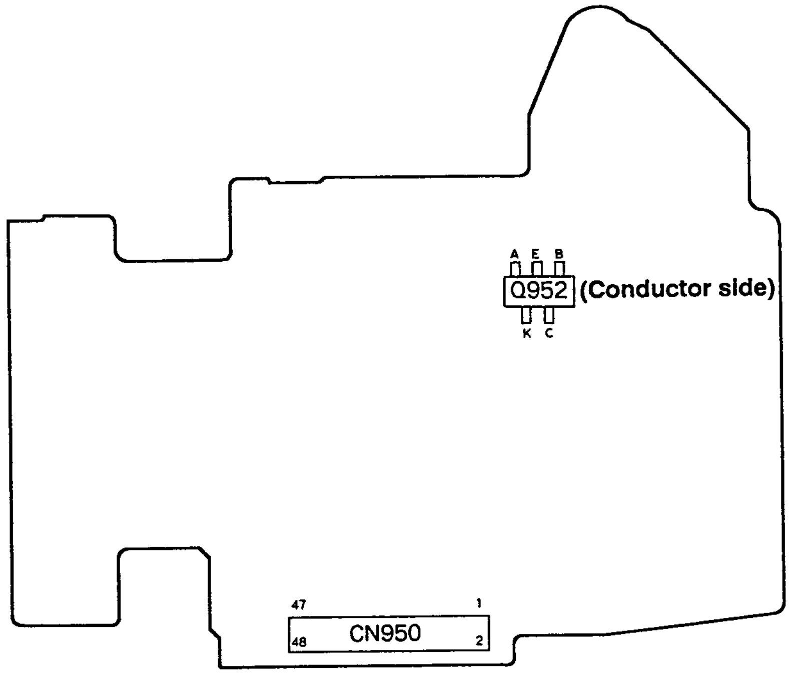
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: RV503 (BRIGHT) Contrast: RV501 (CONT)

Adjustment method:

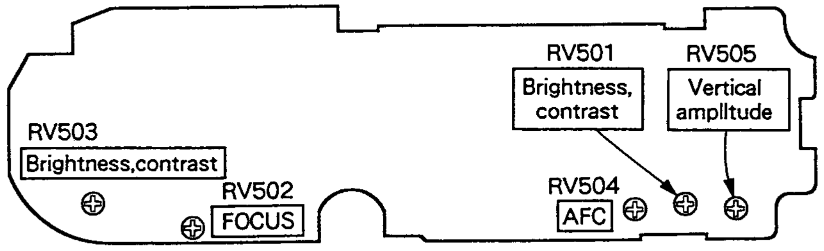
1) Adjust RV503 (BRIGHT) and RV501 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-4. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

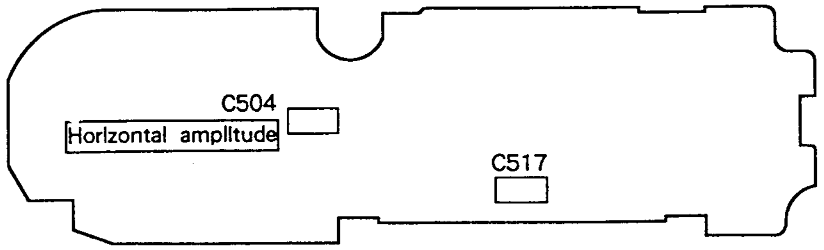
PS-308 BOARD (COMPONENT SIDE)


A E B
Q952 (Conductor side)
K C
47
1
48
CN950
2

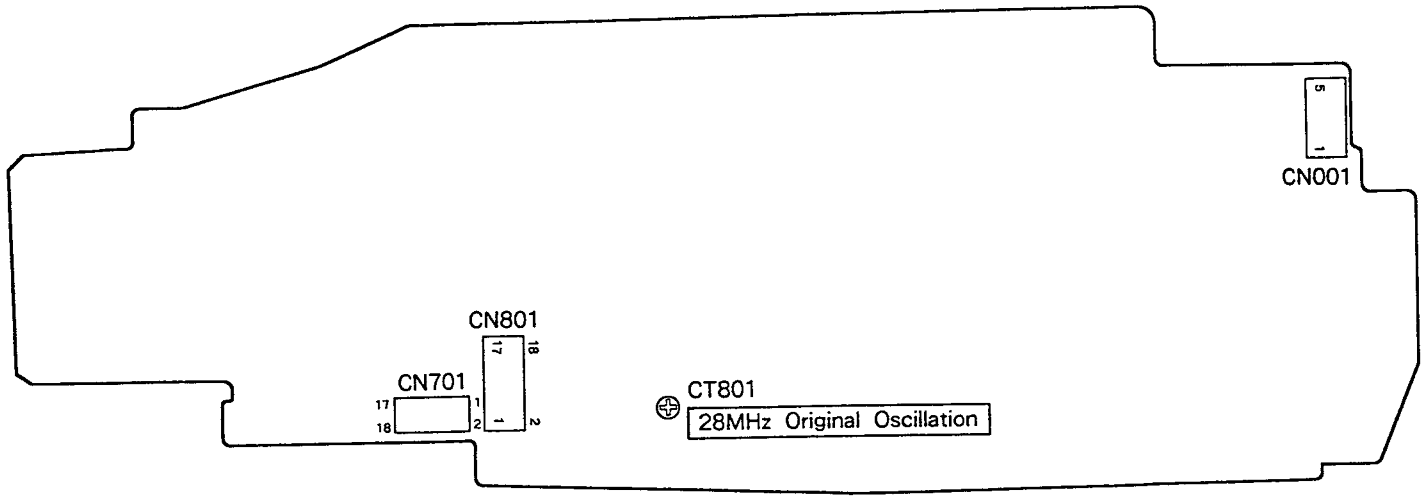
VF-44 BOARD (COMPONENT SIDE)


RV501
Brightness, contrast
RV505
Vertical amplitude
RV503
Brightness,contrast
RV502
FOCUS
RV504
AFC

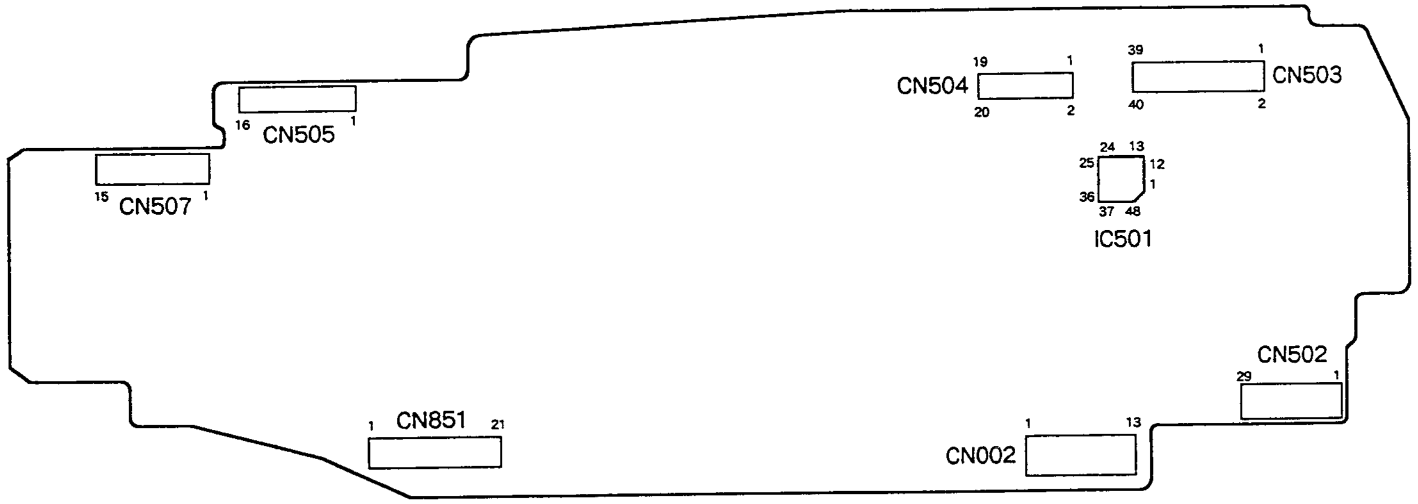
VF-44 BOARD (CONDUCTOR SIDE)


C504
Horizontal amplitude
C517

CS-37 BOARD (COMPONENT SIDE)


5
1
CN001
CN801
17
18
1
2
CN701
17
18
1
2
CT801
28MHz Original Oscillation

CS-37 BOARD (CONDUCTOR SIDE)


19
1
CN504
20
2
39
1
CN503
40
2
16
CN505
1
15
CN507
1
24
13
25
12
1
36
37
48
IC501
CN502
29
1
1
CN851
21
1
13
CN002

SECTION 8
MECHANICAL SECTION ADJUSTMENTS

For Mechanical Adjustments

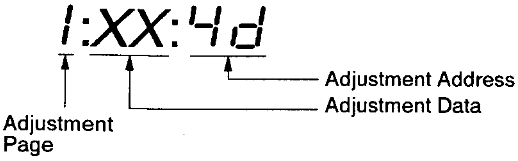
Refer to the separate volume of mechanical adjustment "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ (A Mechanism)" for the adjustments and checks of mechanism section and the mechanical parts replacement. (9-973-199-11)
For setting of the track shift mode, however, refer to the following.

8-1. SETTING THE TRACK SHIFT MODE

Note: Camera part and video part should have been installed.

[Setting Method]

1) Set the adjustment commander to the HOLD ON side.
2) Set page: 1, address: 01 and data: 01, and then release the protector.
3) Set page: D and address: 01.
4) Set adjustment data to 03 (test mode 3) by PLAY or STOP button.
   (When HOLD OFF once after the setting and HOLD ON again, the display of the address data will be changed. To set the another mode with shifting, repeat the procedures from 3).)
5) Set to the HOLD OFF side in order to set the normal mode.



8-2. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surfaces (tape guides, drum, capstan shaft, pinch roller.)
2) Connect to the oscilloscope.
   CH1: CS-37 board CN001 pin ③ (PB RF)
   CH2: CS-37 board CN001 pin ④ (SWP)
3) Play back the tracking alignment tape (WR5-1CP: 8-967-995-07).
4) Check that the RF waveform of the oscilloscope is flat at both inlet and outlet sides. If not flat, make adjustment as follows. (Refer to Fig. 8-1 and 8-2)

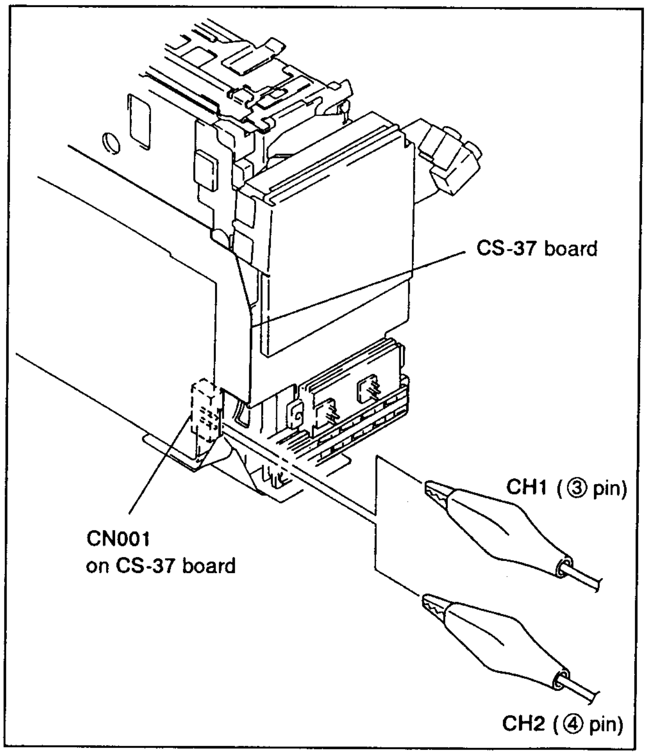


Fig.8-1.

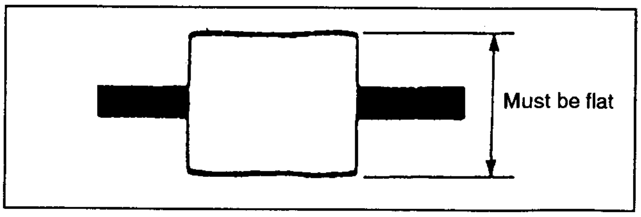


Fig.8-2.

SECTION 9
VIDEO SECTION ADJUSTMENT

When performing adjustments, refer to the layout diagrams for adjustment related parts beginning from page 234.

9-1. PREPARATIONS BEFORE ADJUSTMENT

The following adjusting instruments are used for adjusting the video section.

9-1-1. Equipments to be used

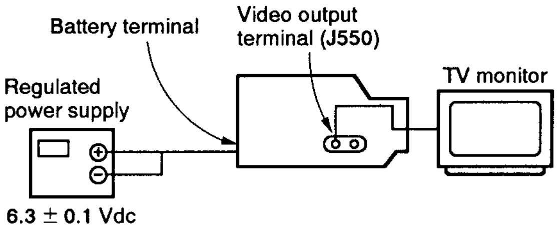
1) TV monitor
2) Oscilloscope: 2 phenomena, band 30 MHz or wider, with delay mode. (Use a 10:1 probe unless specified otherwise.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuater
10) Regulated power supply
11) Alignment tape
    For tracking adjustment (WR5-1CP)
    Part Code: 8-967-995-07
    For video frequency characteristics adjustment (WR5-6C)
    Part Code: 8-967-995-17
    For checking operations
    (WR5-4CL)[Note 1]
    Part Code: 8-967-995-56
    (WR5-5CSP)[Note 2]
    Part Code: 8-967-995-47
    Note: The following alignment tapes can also be used.
    1) WR5-3CL (8-967-995-36)
    2) WR5-4CSP (8-967-995-46)
12) Remote control unit for adjustment (J-6082-053-A)
13) VA-77 board extension cord (20P, 0.8 mm)
    Part Code: J-6082-169-A
14) VA-77 board extension cord (40P, 0.8 mm)
    Part Code: J-6082-168-A
15) Mecha deck extension cord (30P, 0.8 mm)
    Part Code: J-6082-167-A

9-1-2. Connecting the equipments

Unless specified otherwise, connect the measuring instruments as shown in Fig. 9-1 and perform the adjustments.

- Camera player power switch·········Position of the player.
- Connect the adjusting remote control unit to the remote terminal (PS-308 board J951).

- Connect the regulated power supply and TV monitor as follows.


Battery terminal
Video output terminal (J550)
TV monitor
Regulated power supply
6.3 ± 0.1 Vdc

- Connect the pattern generator as follows.
  Connect pin ④ of CN507 on CS-37 board to GND with a jumper wire.
  After adjusting, be sure to disconnect this wire.

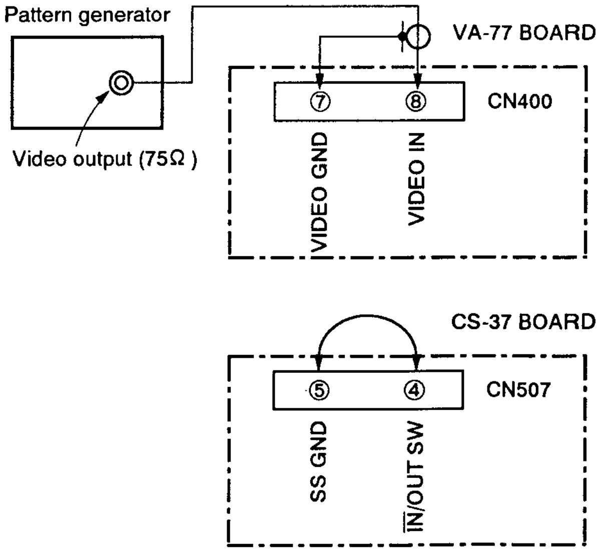

Pattern generator
VA-77 BOARD
⑦
⑧
CN400
Video output (75Ω)
VIDEO GND
VIDEO IN
CS-37 BOARD
⑤
④
CN507
SS GND
IN/OUT SW

Fig. 9-1.

9-1-3. Precautions upon adjustment

The MA-155 board (Mic amplifier) is not required for adjusting the video section. Disconnect CN571 (8 pins) on VK-28 board.

- Remove the following connector if the focus hold button gets in the way.
  1. CN852 of CS-37 board (8 pins)

- Remove the two lens block installing screws and the following connectors if the lens block gets in the way.
  1. CN801 of the CS-37 board (18 pins)
  2. CN851 of the CS-37 board (20 pins)
  3. CN902 of the CD-96 board (5 pins)

- Use an extension cable when opening the VA-77 board.
  1. Between CN201 of VA-77 board and CN503 of CS-37 board.
     40 pins, 0.8 mm pitch extension cable (J-6082-168-A)
  2. Between CN202 of VA-77 board and CN504 of CS-37 board.
     20 pins, 0.8 mm pitch extension cable (J-6082-169-A)

- Use an extension cable when opening the CS-37 board, and when checking the operation of the mechanical section.
  1. Between CN502 of CS-37 board and FP-600 board.
     30 pins, 0.8 mm pitch extension cable (J-6082-167-A)

- If cabinet (R) gets in the way, remove the following connectors after setting to the forced POWER ON mode using the adjusting remote control unit.
  1. CN505 of the CS-37 board (16 pins)

[How to set the forced POWER ON mode]

1. Release the protect of page D with the adjusting remote control unit.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D.
3. When the power is turned on in the VTR mode, set data 02. (Set data 01 when the power is turned on in the CAMERA mode.)
4. Press the PAUSE button of the adjusting remote control unit.
5. Disconnect the main power supply (6.3V).

The forced POWER ON mode has been set by the above operations. Hereafter, when the main power is supplied, the power will turn on in the VTR mode (or CAMERA mode). As the position of the power supply switch (CAMERA/OFF/PLAYER) and the presence/absence of the power supply switch becomes unrelated, the cabinet (R) can be removed.
Be sure to release the forced POWER ON mode after completing repair/adjustment.

[How to release the forced POWER ON mode]

1. Release the protect of page D.
   Page: 1, Address: 00, Data: 01
2. Select address 21 of page D, and set data: 00.
   (Forced POWER ON mode releasing)
3. Press the PAUSE button of the adjusting remote control unit.

9-1-4. How to Set the REC Mode in the Model without REC Switch

1. REC key forbidden accept mode cancel
   1. Connect the adjustment remote controller to the REMOTE terminal.
   2. Turn on the power.
   3. Turn on the HOLD switch of the adjustment remote controller.
   4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
   5. Select the page: D address: 02, and set the data to 8F. (REC key forbidden accept mode cancel)
   6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

The REC key is accepted through the above procedure. The adjustment remote controller may be removed, hereafter.

2. REC mode setting
   1. Connect Pin ⑭ of CN507 (KEY IN 1) and Pin ⑨ of CN507 (KEY OUT 3) on CS-37 board with a jumper wire until the VTR is set to REC mode.

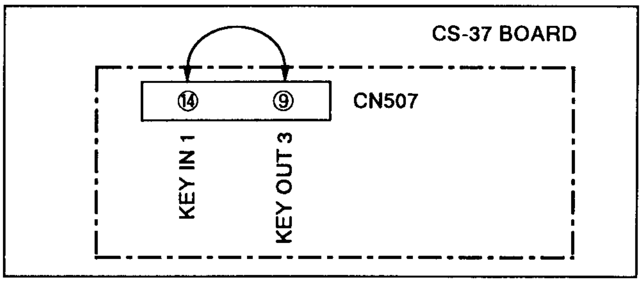


Fig. 9-2.

3. Procedure after completed the adjustment
   Be sure to return the mode to REC key forbidden accept mode after adjustment.
   1. Connect the adjustment remoter controller to the REMOTE terminal.
   2. Turn on the power.
   3. Turn on HOLD switch of the adjustment remote controller.
   4. Select the page: 1 address: 00, and set the data to 01. (Protect mode cancel)
   5. Select the page: D address: 02, and set the data to 8E. (Setting of the REC key forbidden accept mode)
   6. Press PAUSE button on the adjustment remote controller. (Write to the non-volatile memory)

9-1-5. Set-up during Adjustment

As the video signal obtained from the pattern generator is used as an adjustment signal during electric adjustments, ensure that this video output signal is within the specification. Connect the oscilloscope to pin ⑧ of CN400 on the VA-77 board, and check that the amplitude of the sync signal of the video signal is approximately 0.3V, the amplitude of the video section is approximately 0.7V, the amplitude of the burst signal is approximately 0.3V and flat, and that the level ratio of the burst signal and the [red] signal is 0.30: 0.66. The video signal (color bar) used for electric adjustments is shown in Fig. 9-3.

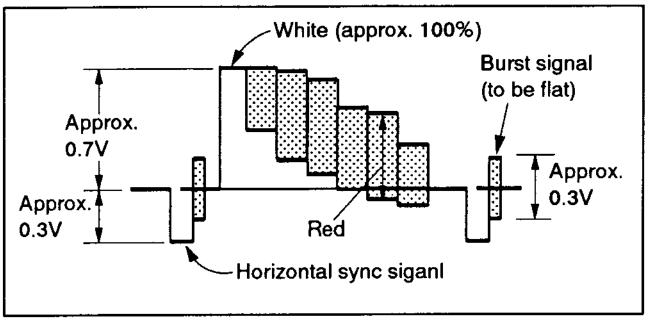


Fig. 9-3. Color Bar Signal of the Pattern Generator

9-1-6. Alignment Tape

The following table lists alignment tapes which are available.
Use the tape specified in the signal column for each adjustment.

If the type of tape to be used for checking operations is not specified, use whichever type.

Name	Record-ing mode	Tape type	Tape speed	Recording contents		Usage
				Video area	PCM area	
Tracking WR5-1CP	L	MP	SP	CH2: Signal for 1 MHz tape path adjustment		Tape path adjustment Switching position adjustment
Video frequency characteristics WR5-6C	L	MP	LP	RF sweep 0 to 10 MHz Marker 1, 3.58, 5.5, 7 MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-5CSP	L	MP	SP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation	• Audio signal (PCM) Monoscope section 20 Hz 20 sec. } Color bar section 400 Hz 20 sec. } 14 kHz 20 sec. } Repeated 4 times 1 kHz 4 minutes	Checking operations
Operation check (LP mode) WR5-4CL	L	MP	LP	• Video signal Color bar 4 minutes Monoscope 4 minutes • Audio signal (AFM) 400 Hz 60% modulation		

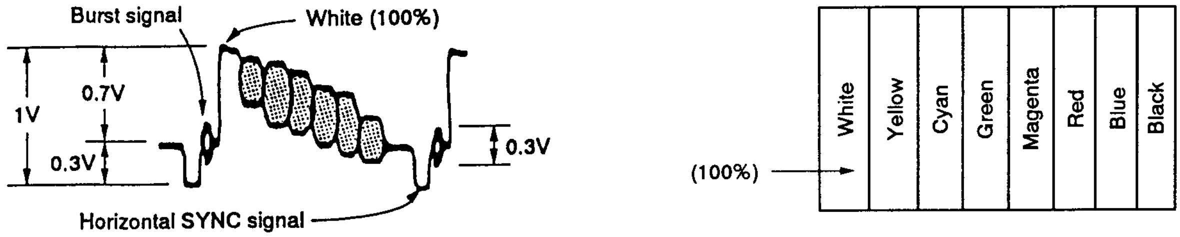
Note: Recording mode
L ·············· Conventional mode
E ·············· hi8 (hi band) mode

Tape type
MP············ Particle type metal tape
ME············ Evaporated type metal tape

Table 9-1.

Fig. 9-3. shows the 75% color bar signals recorded on the alignment tape.

Note: Measure at the video output terminal (Terminated at 75 Ω)


Burst signal
White (100%)
0.7V
1V
0.3V
0.3V
Horizontal SYNC signal
(100%)
White
Yellow
Cyan
Green
Magenta
Red
Blue
Black

Color bar signal waveform

Color bar pattern

Fig. 9-4. Alignment tape color bar signal

9-1-7. Output Level and Impedance

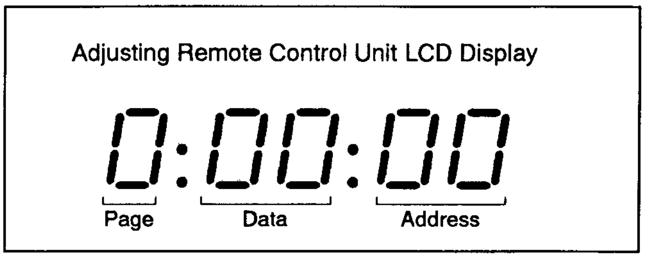
Video output	phone jack Output signal: 1 Vp-p, 75Ω unbalanced, negative sync
Audio output	phone jack Specified output: –7.5 dBs Output impedance: More than 2.2 kΩ

9-1-8. Service Mode

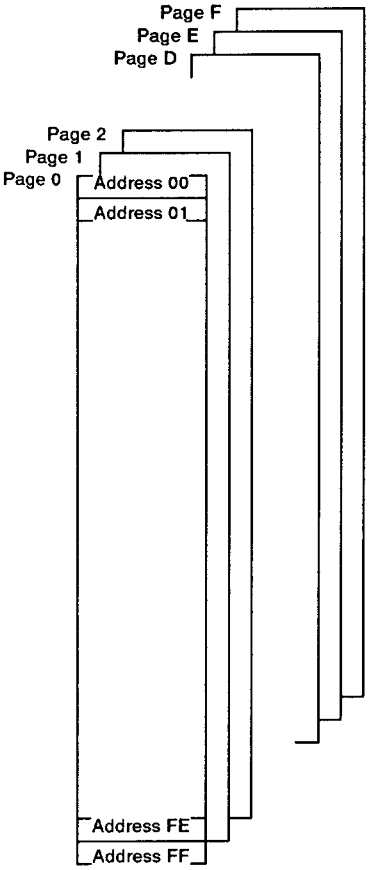
1. Setting the Service mode

The service mode consists of the adjustment mode which adjusts the EVR and the test mode which displays the condition of the unit.

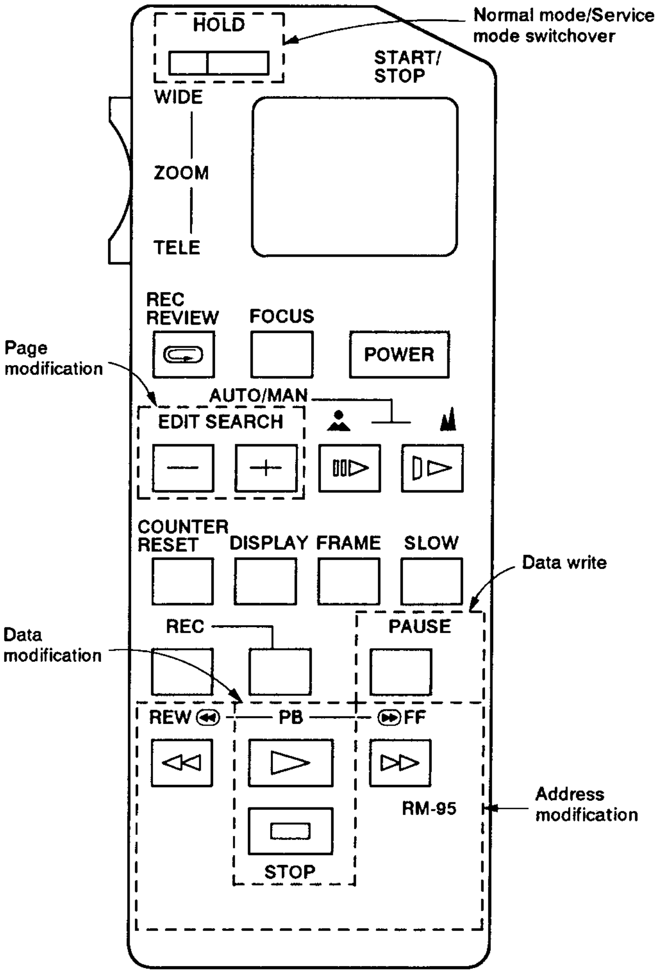
The unit can be shifted into the test mode and adjustment mode by connecting the adjusting remote control unit (set the HOLD switch to the HOLD side).


Adjusting Remote Control Unit LCD Display
0:00:00
Page
Data
Address

(1) Service LANC memory map

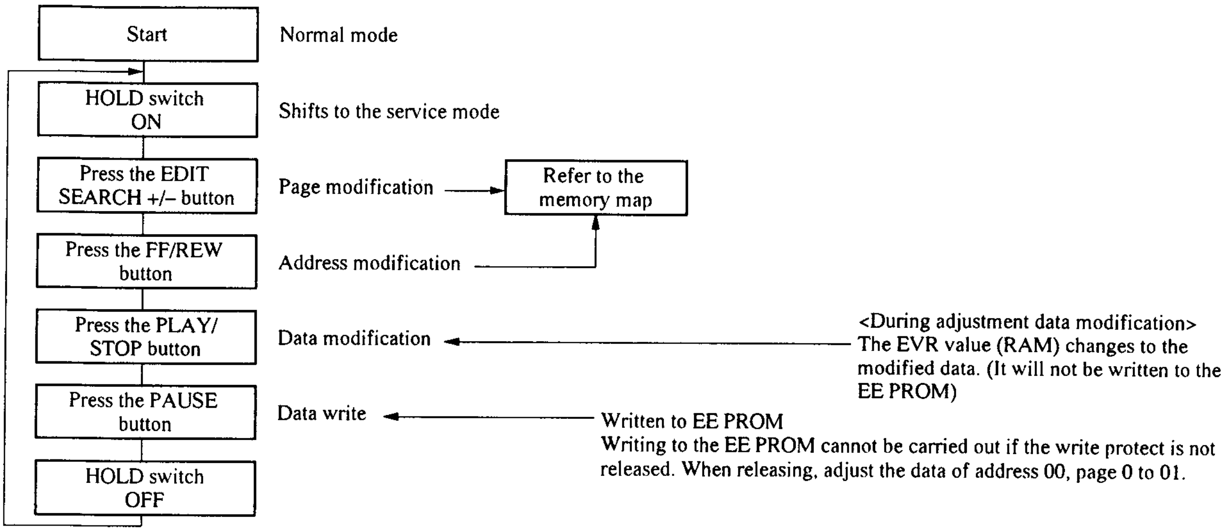

Page F
Page E
Page D
Page 2
Page 1
Page 0
Address 00
Address 01
Address FE
Address FF

Adjusting remote control unit RM-95 (J-6082-053-A)


HOLD
Normal mode/Service mode switchover
START/ STOP
WIDE
ZOOM
TELE
REC REVIEW
FOCUS
POWER
Page modification
AUTO/MAN
EDIT SEARCH
COUNTER RESET
DISPLAY
FRAME
SLOW
Data write
REC
PAUSE
Data modification
REW
PB
FF
RM-95
Address modification
STOP

Page	Page allocation	Description
0	Not used	
1	Mode Control RAM, I/O	RAM and I/O interface data memory area required for operating the mode controller. Data is not held when the power is turned off because this area is not ROM.
2~4	Mechanical Control RAM, I/O	RAM and I/O memory area of the mechanical controller.
5	Not used	
6~8	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
9	Not used	
A	Camera Control RAM, I/O	RAM and I/O memory area of the camera control.
B, C	Not used	
D	VTR EE-PROM	ROM memory area of the VTR part. Data of this area is held by EE-PROM when the power is turned off. Releasing protect is required for changing data.
E	Not used	
F	Camera EE-PROM	ROM memory area of the camera part. Data of this area is held by EE•P•ROM when the power is turned off.

(2) Shifting to the Service Mode Using the Adjusting Remote Control Unit


Start
Normal mode
HOLD switch ON
Shifts to the service mode
Press the EDIT SEARCH +/– button
Page modification
Refer to the memory map
Press the FF/REW button
Address modification
Press the PLAY/ STOP button
Data modification
Press the PAUSE button
Data write
HOLD switch OFF

<During adjustment data modification>
The EVR value (RAM) changes to the modified data. (It will not be written to the EE PROM)

Written to EE PROM
Writing to the EE PROM cannot be carried out if the write protect is not released. When releasing, adjust the data of address 00, page 0 to 01.

Command Name	**Command Function**	**Normal LANC command**
Page Up	Page +1	Edit Search +
Page Down	Page –1	Edit Search –
Direc Page Set	Sets the specified page	Event Clear
Address Up	Address +1	Fast Forward
Address Down	Address –1	Rewind
Data Up	Data +1	Play Back
Data Down	Data –1	Stop
Store	Write the data to the EE PROM. RAM	Pause

2. Types of Self-diagnostic Feature

MODE		Contents
TEST	Camera adjustment	Refer to Camera Adjustment
	Switching position adjustment	Refer to each adjustment page
	Battery DOWN adjustment	
	Video, Audio adjustment	
ADJUST	Pass Adjustment track shift	When adjusting tape pass, set this mode and shift the tracking.
	Emergency STOP inhibition	Detection of emergency is inhibited. This allows the following items. • Power is not turned off when the battery is ended. • SP/LP is not automatically distinguished. • Emergence is not detected except for TOP/END detection of the TAPE.
	Read of emergence code	The following functions are added to the emergency display function currently in use. ① The lithium battery is not required because to memorize into EE-PROM is allowed. ② The first emergency and the last emergency are memorized. ③ The mode when the emergency is generated is memorized, in addition to the emergency contents.
	Motor single check	Rotating in forward direction, reverse direction, stopping of each motor can be separately controlled. • Drum motor • Capstan motor • Loading motor
	Function switch check	The acceptance of the function switch of the unit can be confirmed by designating an address. On the contrary, RM-95 can command the substitution for the function switch of the unit.
	Mechanical switch check	The contents of the mechanical switch and the mode switch can be confirmed.
	Sensor check	The following sensor is input by performing A/D converting, and the A/D converted value can be confirmed. TOP sensor, End sensor, S REEL FG, T REEL FG, Thermistor for SWP correction, DEW sensor.
	Reception contents check of wireless remote control	The received code contents of the remote control code can be confirmed.

3. Page D Write Protect

Release/set the page D write protect.

Page 1	Address 00

Data	Function
00	Normal (Write protect condition)
01	Write protect release

4. Page F Write Protect

Release/set the page F write protect.

Page 6	Address 00

Data	Function
10	Normal (Write protect condition)
01	Write protect release

5. Test Mode Setting

Each type of test mode is set/released. Release the protect (page: 1, address: 00, data: 01), before setting the data.

Page D	Address 01

Data	Function
00	Normal
01	Test mode 1 Various emergency inhibition and release Drum, capstan, loading motor, reel, tape top, end, DEW SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP) 5 minutes pause release inhibition Power off inhibition • release by battery end
02	Test mode 2 1'CH frequency response adjustment SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
03	Test mode 3 Track shift Plays back the track shift Rear lock distinction inhibition during PB SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
04	Test mode 4 Rear lock mode Rear lock playback is performed SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)
05	Test mode 5 SP/LP automatic distinction inhibition, manual switchover (EDIT SW ON: LP, OFF: SP)

※ This address data will be recorded on the non-volatile memory by pressing the PAUSE button on the adjusting remote control unit. Take note, as when this happens, the test mode will not be released even if the main power is turned off (6.3 Vdc).

※ Be sure to return the data of this address data to 00 after completing adjustments/repairs.

6. Emergency code

Troubles (errors) can be checked.

Page D	Address 06

First emergency code

······The first error code generated

Page D	Address 07

Last emergency code

······ The last error code generated (this data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 06 and 07 to 00 after completing repairs/adjustments.

※ When rewriting data, be sure to press the PAUSE button of the remote control unit after resetting the data.

Code	Error condition
00	No error
01	Loading motor error
02	Reel error during unloading
03	Other reel errors
04	Capstan error
05	DRUM FG error during drum start up
06	DRUM PG error during drum start up
07	DRUM FG error during drum regular condition
08	DRUM PG error during drum regular condition
09	DRUM Phase error during drum regular

7. Emergency mode

The operation mode during an error outbreak can be checked.

Page D	Address 08

First emergency mode
……The operation mode when the first error is generated

Page D	Address 09

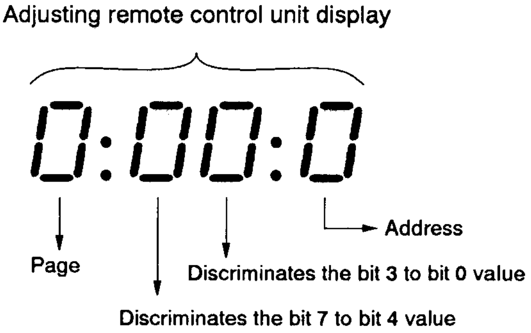
Last emergency mode
……The operation mode when the last error is generated
(This data will be modified each time an error occurs.)

※ Be sure to rewrite the data of addresses 08 and 09 to 00 after completing repairs/adjustments.
※ When rewriting data, be sure to press the PAUSE button of the remote control unit after setting the data.
※ Addresses 08 and 09 of page 0 and addresses 08 and 09 of page D have the same functions.

Code	Error condition
00	BEFOR INITIALIZE
01	EJECTED
02	NORMAL STOP
03	FF
04	NORMAL REC
06	NORMAL PB
07	PB PAUSE
12	LOADING
14	REC PAUSE
26	X1
27	1/5 SLOW
31	UNLOADING
36	-X1
37	-1/5 SLOW
46	CUE
47	1/10 SLOW
56	REVIEW
57	-1/10 SLOW
62	STOP TAPE END
66	X2
67	FRAME
72	STOP TAPE TOP
76	-X2
77	-FRAME
83	REWIND
85	REC REVIEW(+)
95	REC REVIEW(–)
A2	EMERGENCY STOP
A5	EDIT SEARCH(+)
B1	EMERGENCY UNLOADING
B2	STOP EMERGENCY 1
B5	EDIT SEARCH(–)
C2	STOP EMERGENCY 2
E2	STOP NO CASSETTE
F5	EDIT PAUSE

8. Bit value Discrimination

It is necessary to discriminate the bit value by the adjusting remote control unit display data for the following items. Discriminate if the bit value is "1" or "0" using the following table.


Adjusting remote control unit display
0:00:0
Address
Page
Discriminates the bit 3 to bit 0 value
Discriminates the bit 7 to bit 4 value

Remote Control Unit Display	Bit Value			
	bit 3 or bit 7	bit 2 or bit 6	bit 1 or bit 5	bit 0 or bit 4
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
Ⓐ→ 8	1	0	0	0
9	1	0	0	1
A (A)	1	0	1	0
B (b)	1	0	1	1
C (c)	1	1	0	0
D (d)	1	1	0	1
Ⓑ→ E (E)	1	1	1	0
F (F)	1	1	1	1

(Example) When the remote control unit display data is "8E", the bit values of bit 7 to bit 4 can be discriminated from column Ⓐ, and that of bit 3 to bit 0 can be discriminated from column Ⓑ.

9. Check of Power Switch, Tape Distinction Switch, etc.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
				$\overline{\text{REC PROOF}}$	ME/$\overline{\text{MP}}$	Hi8/$\overline{\text{Normal}}$	HG/$\overline{\text{Normal}}$

"1"=Recording impossible
"0"=Recording possible

"1"=ME tape
"0"=MP tape

"1"=Hi8 mode playback
"0"=Normal mode playback

"1"=HG tape
"0"=Others

Page 1	Address 23

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
					$\overline{\text{CC DOWN}}$		

"0"=During cassette compartment lock

10. RECOG SW Check

Page 1	Address 3D

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
V MUTE	A MUTE	VA PB MODE	JOG	PB CLOG	REC CLOG	SYNC DET	LP/$\overline{\text{SP}}$

"1"=LP mode playback
"0"=SP mode playback

"1"=SYNC is detected
"0"=SYNC is not detected

"1"=CLOG is detected
"0"=Normal

"1"=When the PB RF signals are being playback normaly
"0"=Others

"1"=JOG mode
"0"=Other

"1"=Playback mode
"0"=Others

"1"=AUDIO MUTE: ON
"0"=AUDIO MUTE: OFF

"1"=VIDEO MUTE: ON
"0"=VIDEO MUTE: OFF

11. Individual Operations of the Drum, Capstan, and Loading Motor

Page 4	Address 11

1) Adjust the mechanical section to the loading completion condition.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 0E.
   (Control permission from the adjusting remote control unit of the motor)
4) By setting the data in the following table to page: 4, address: 11, the corresponding motors can be operated individually.
5) After checking the operations, turn off the main power (6.3 Vdc).

Data	Operation
00	Normal
02	Drum forward rotation
04	Drum reverse rotation
06	Capstan forward rotation
08	Capstan reverse rotation
0A	Loading motor forward rotation
0C	Loading motor reverse rotation
03	All motors stop
05	
07	
09	
0B	
0D	
0F	

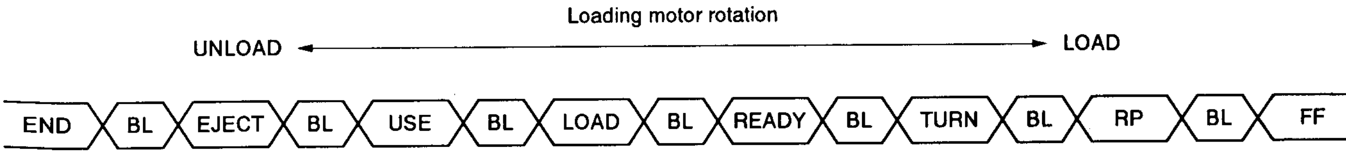
12. Mode Switch Check

The mode switch position (mechanical section condition) can be checked.

Page 1	Address 3E

Bit7	Bit6	Bit5	Bit4	Bit3	Bit2	Bit1	Bit0
MSW 0	MSW 1	MSW 2					

			POSITION	FUNCTION	CC DOWN
1	1	1	BL	Interval of each position	
0	1	1	END	FULL END processing (T side lock removal)	1
0	0	1	EJECT	Cassette compartment ejection	1
1	0	1	USE	EJECTED (Unskate end)	1
0	0	1	LOAD	LOADING (Skate in)	0
1	0	0	READY	NORMAL STOP position	0
1	1	0	TURN	OFF of pinch roller only with PB ↔ REV (oscillating position)	0
0	1	0	RP	PB, REC, RVS, REV, REW	0
0	0	0	FF	FF/CUE	0



13. Mode control micro processor key matrix check

The key input can be checked.

Page 1	Address 68~6D

	Bit7	Bit6 (K IN 6)	Bit5 (K IN 5)	Bit4 (K IN 4)	Bit3 (K IN 3)	Bit2 (K IN 2)	Bit1 (K IN 1)	Bit0 (K IN 0)
Address 68 (K OUT 0)		BEEP ON/OFF	VTR POWER	EDIT SEARCH (+)	EDIT SEARCH (−)		START/STOP	STANDBY
Address 69 (K OUT 1)		AE PORTRAT	CAMERA POWER	ZERO MEMORY	COUNTER RESET	FF	REW	EJECT
Address 6A (K OUT 2)		AE SPORTS			TAPE/BATT CHECK	STOP	PLAY	EDIT ON/OFF
Address 6B (K OUT 3)		AE SHUTTER	EVENT	TIME	DATE	PAUSE		
Address 6C (K OUT 4)				BACK LIGHT	FADER			
Address 6D (K OUT 5)		AUTO FOCUS ON/OFF						

14. Page D Address List

Note 1: The adjustment data initial value is the data to be input before performing video section adjustment (page D), when the page D data has been erased due to some cause.

Note 2: The data listed in the adjustment data memo column are the fixed data.
Check that these data have not been accidentally rewritten, after completing adjustments.

Address	Name	Function [ ] Indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
00	Category code	Not used	00	00
01	Test mode		00	00
02	Destination flag		8E	8E
03	BATT END	Battery end adjustment	90	
04	SW POSITION	SW POSITION adjustment	80	
05	SW POSITION	SW POSITION adjustment	0B	
06	EMERGENCY code (FIRST)	Error code and mode are memorized. Rewrite the data of these addresses to 00 after repairs/adjustments	00	00
07	EMERGENCY code (LAST)		00	00
08	EMERGENCY mode (FIRST)		00	00
09	EMERGENCY mode (LAST)		00	00
0A	SR DATA (MP NORMAL SP)	CXA1207 serial data	24	24
0B	SR DATA (MP NORMAL LP)	CXA1207 serial data	16	16
0C	SR DATA (ME Hi8 SP)	CXA1207 serial data	24	24
0D	SR DATA (ME Hi8 LP)	CXA1207 serial data	16	16
0E	SR DATA (ME NORMAL SP)	CXA1207 serial data	24	24
0F	SR DATA (ME NORMAL LP)	CXA1207 serial data	16	16
10	SR DATA (MP Hi8 SP)	CXA1207 serial data	24	24
11	SR DATA (MP Hi8 LP)	CXA1207 serial data	16	16
12	SR DATA (EDIT ON NORMAL)	CXA1207 serial data	24	24
13	SR DATA (EDIT ON Hi8)	CXA1207 serial data	16	16
14	CAM TITLE BLU R-Y	Camera titler color adjustment [Blue] Not used		
15	CAM TITLE BLU B-Y	Camera titler color adjustment [Blue] Not used		
16	CAM TITLE GRN R-Y	Camera titler color adjustment [Green] Not used		
17	CAM TITLE GRN B-Y	Camera titler color adjustment [Green] Not used		
18	CAM TITLE CYN R-Y	Camera titler color adjustment [Light blue] Not used		
19	CAM TITLE CYN B-Y	Camera titler color adjustment [Light blue] Not used		
1A	CAM TITLE RED R-Y	Camera titler color adjustment [Red] Not used		
1B	CAM TITLE RED B-Y	Camera titler color adjustment [Red] Not used		
1C	CAM TITLE VIO R-Y	Camera titler color adjustment [Violet] Not used		
1D	CAM TITLE VIO B-Y	Camera titler color adjustment [Violet] Not used		
1E	CAM TITLE YEL R-Y	Camera titler color adjustment [Yellow] Not used		
1F	CAM TITLE YEL B-Y	Camera titler color adjustment [Yellow] Not used		
20		X2MUTE, SIRCS EJECT etc	0C	0C
21		FORCED VTR ON, CAM ON etc DATA — MODE 01 — FORCED CAMERA POWER ON 02 — FORCED VTR POWER ON	00	00

Table 9-2 (1).

Address	Name	Function [ ] indicate the adjustment voltage output terminal	Adjustment data	
			Initial value	Memo column
22~29		Not used		
2A		Slow brake adjust (Forward)	00	00
2B		Slow brake adjust (Reverse)	00	00
2C		Still brake adjust	00	00
2D	BATT REMAIN 1	Amount of remaining battery	A3	
2E	BATT REMAIN 2	Amount of remaining battery } Battery end adjustment	9C	
2F	BATT REMAIN 3	Amount of remaining battery	97	
30~39		Not used		
3A	MT 1'CH	Not used [IC204 ③]	C0	C0
3B~42		Not used		
43	MT 1CH	1CH playback frequency characteristics adjustment [IC204 ⑲]	C0	
44		Not used		
45	MT 2CH	2CH playback frequency characteristics adjustment [IC204 ②]	C0	
46	REC C RF (EE)	REC C RF adjustment [IC203 ⑩]	62	
47	REC C RF (PB)	Playback REC C RF level [IC203 ⑩]	00	00
48	RF CONT (ME)	ATF RF level (ME) [IC204 ④]	77	77
49	RF CONT (MP)	ATF RF level (MP) [IC204 ④]	70	70
4A	EE LEVEL	EE level adjustment [IC203 ⑮]	6C	
4B		Not used		
4C	COMB ADJ	Chroma comb filter adjustment [IC203 ③]	A4	
4D	SR-IR	IR adjustment [IC203 ②]	A4	
4E		Not used		
4F	CARR	Y-FM carrier frequency adjustment [IC203 ⑤]	9B	
50		Not used		
51	DEV	Y-FM deviation adjustment [IC203 ⑥]	95	
52		Not used		
53		Not used		
54	REC Y (ME)	REC Y recording current adjustment (ME) [IC203 ⑦]	6F	
55	REC Y (MP)	REC Y recording current adjustment (MP) [IC203 ⑦]	6F	
56	REC Y (PB)	Playback REC Y level [IC203 ⑦]	00	00
57	PB Y (EE)	EE PB Y level [IC204 ⑮]	00	00
58	PB Y (E)	Hi8 PB Y level adjustment [IC204 ⑮]	CF	
59	PB Y (L)	Normal PB Y level adjustment [IC204 ⑮]	69	
5A	EMPH LVL (EE)	EE emphasis input level adjustment [IC203 ④]	81	
5B	EMPH LVL (PB)	Playback emphasis input level adjustment [IC203 ④]	93	
5C~77		Not used		
78	REC MATRIX	REC matrix adjustment [IC204 ⑫] Not used		
79	PB MATRIX	PB matrix adjustment [IC204 ⑫] Not used		
7A	1.5 IR	1.5 MHz IR adjustment [IC204 ⑤]	72	
7B	1.5 DEV	1.5 MHz deviation adjustment [IC204 ⑥]	91	
7C	1.7 IR	1.7 MHz IR adjustment [IC204 ⑧] Not used		
7D	1.7 DEV	1.7 MHz deviation adjustment [IC204 ⑨] Not used		
7E	AUDIO FADER	Audio fader [IC204 ⑦] Not used		
7F~FF		Not used		

Table 9-2 (2)

9-2. POWER SYSTEM ADJUSTMENTS

1. Oscillator Frequency Check (PS-308 board)

Mode	Camera record
Subject	Arbitrary
Measurement Point	Q952 collector
Measuring Instrument	Frequency counter
Specified Value	464 ± 5 kHz

Adjusting method:

1) Check that the oscillator frequency satisfies the specified value.

2. Power Voltage Check (PS-308 board)

Mode	Camera record
Subject	Arbitrary
Measuring Instrument	Digital voltmeter
EVF 5V check	
Measurement Point	Pin ⑥ of CN950
Specified Value	5.01 ± 0.15 Vdc
D5V check	
Measurement Point	Pins ⑰ and ⑱ of CN950
Specified Value	4.98 ± 0.15 Vdc
D4V check	
Measurement Point	Pins ⑮ and ⑯ of CN950
Specified Value	4.03+0.15 Vdc
VIDEO 5V check	
Measurement Point	Pins ② and ④ of CN950
Specified Value	5.05 ± 0.15 Vdc
SS 5V check	
Measurement Point	Pin ㉓ of CN950
Specified Value	5.02 ± 0.15 Vdc
AUDIO 5V check	
Measurement Point	Pin ⑧ of CN950
Specified Value	5.05 ± 0.15 Vdc
CAM5V check	
Measurement Point	Pins ⑬ and ⑭ of CN950
Specified Value	4.90 ± 0.15 Vdc
15V check	
Measurement Point	Pin ⑪ of CN950
Specified Value	15.04 ± 0.4 Vdc
–9V check	
Measurement Point	Pin ⑫ of CN950
Specified Value	–8.5 ± 0.4 Vdc

9-3. SYSTEM CONTROL SYSTEM ADJUSTMENTS

1. Page D Initial Value Input

If the page D data has been erased due to some cause, input the page D initial value before performing adjustments. For details on the initial value, refer to "Page D address list" in "9-1-8. Service Mode".

Mode	E-E
Signal	Arbitrary
Adjustment Page	D
Adjustment Address	00 to 7B

Input method:

1) Release the write protect.
   Page: 1, address: 00, data: 01
2) Select page D, and input the initial value to each address.
   (After setting the data (initial value), be sure to press the PAUSE button of the adjusting remote control unit before changing the address.)

2. Battery End Adjustment

Mode	Camera record
Signal	Arbitrary
Measurement Point	LCD display of the adjusting remote control unit
Measuring Instrument	
Adjustment Page	D
Specified Value	03 (BATT END) 2D (BATT REMAIN 1) 2E (BATT REMAIN 2) 2F (BATT REMAIN 3)

Connection:

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

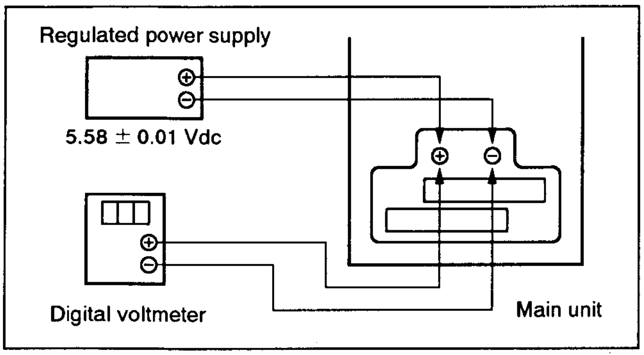


Fig. 9-5.

Adjusting method:

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display is 6.3 ± 0.1 Vdc.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Set data: 01 to page: 4, address: 01.
   (Test mode 1 setting)
4) Decrease the output voltage of the regulated power supply so that the digital voltmeter display is 5.58 ± 0.01 Vdc.
5) Select page: 4, address: 10, read the adjusting remote control unit display data, and set to D10.
6) Set data D10 to page: D, address: 03, and press the PAUSE button of the adjusting remote control unit.
7) Convert D10 to decimal notation, and obtain D10′. (Refer to Table 7-6. "Hexadecimal notation–decimal notation conversion table")
8) Calculate D2D′, D2E′ and D2F′ using following equations (decimal notation calculation).
   D2D′=D10′+18
   D2E′=D10′+14
   D2F′=D10′+8
9) Convert D2D′, D2E′ and D2F′ to hexadecimal notation, and obtain D2D, D2E and D2F.
10) Set data: D2D to page: D, address: 2D, and press the PAUSE button of the adjusting remote control unit.
11) Set data: D2E to page: D, address: 2E, and press the PAUSE button.
12) Set data: D2F to page: D, address: 2F, and press the PAUSE button.
13) Set data: 00 to page: 4, address: 01. (Test mode 1 release)
14) Perform "Battery Down Check".

3. Battery Down Check

Mode	Camera record
Subject	Arbitrary

Connection

1) Connect the regulated power supply and the digital voltmeter as shown in Fig. 9-5.

Checking method:

Remove the adjusting remote control unit, and perform the following check. If the check is not satisfied, perform from the beginning again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter display becomes 6.3 ± 0.1 Vdc.
2) Set to the camera recording mode.
3) Decrease the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.80 ± 0.01 Vdc.
4) Check that the 🔋 mark on the EVF (viewfinder) display is not lighted up. (TALLY lamp lights up).
5) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.62 ± 0.01 Vdc.
6) Check that the 🔋 mark and the TALLY lamp on the EVF display on the EVF display blinks every second.
7) Decrease the the output voltage of the regulated power supply so that the digital voltmeter display becomes 5.42 ± 0.01 Vdc.
8) Check that the 🔋 mark and the TALLY lamp on the EVF display are blinking faster, the VTR stops and the power supply turns off.

9-4. SERVO SYSTEM ADJUSTMENTS

1. Switching Position Adjustment (CS-37 board)

Mode	Playback
Signal	Alignment tape: For tracking adjustment (WR5-1CP)
Measurement Point	CH1: Pin ④ of CN001 (RF SWP) CH2: Pin ③ of CN001 (PB RF)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	04 (SW POSITION) (LOW) 05 (SW POSITION) (HIGH)
Specified Value	t1=0 ± 10 μsec

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Set data: 0B to page: D, address: 05.
3) Change the data of page: D, address: 05 and minimize "t1". (Coarse adjustment)
4) Change the data of page: D, address: 04, and adjust so that the switching position (t1) becomes the specified value. (Fine adjustment)
5) Press the PAUSE button of the adjusting remote control unit.

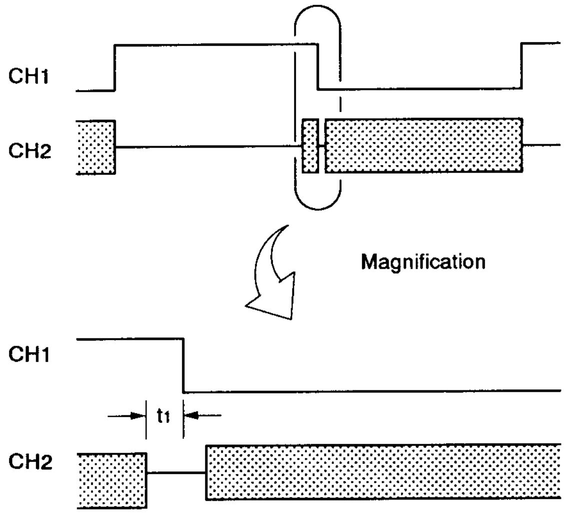


Fig. 9-6.

9-5. VIDEO ADJUSTMENTS

The adjustments of the video system must be performed according to the following adjustment procedure.
The color video signal supplied from the pattern generator is used as the video input signal for adjusting the video system in recording mode. Check that the sync signal and the color burst signal satisfy the specification specified during the adjustment set-up shown in Fig. 9-3.

[Adjusting procedure]

1) Playback frequency characteristic adjustment
2) Flying erase check
3) VXO oscillation frequency check
4) EE level adjustment
5) IR adjustment
6) Chroma comb filter adjustment
7) Emphasis input level adjustment
8) PB Y level adjustment
9) PB LINE OUT level adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis f0 adjustment
13) REC Y level adjustment
14) REC C RF level adjustment
15) REC ATF level check

1. Playback Frequency Characteristic Adjustment (CS-37 board)

Note: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristic adjustment (WR5-6C)
Measurement Point	CH1: Pin ③ of CN001 EXT TRIG: Pin ④ of CN001
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [–]
Adjustment Page	D
Adjustment Address	43 (MT 1CH) [45 (MT 2CH)]
Specified Value	3.58 MHz level: 5.5 MHz level= 4: (3 ± 0.3)

Adjusting method:

1) Confirm that the EDIT switch is OFF position.
2) Release the protect.
   Page: 1, address: 00, data: 01
3) Change the data of address: 43 [45] of page D, and adjust the level ratio of 3.58 MHz and 5.5 MHz of PB RF output waveform to the specified value.
   Note: After each address adjustment, be sure to press the PAUSE button of the adjusting remote control unit and memorize the data.

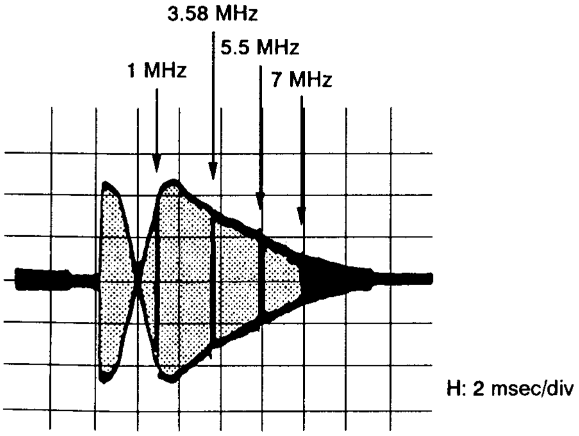


Fig. 9-7.

2. Flying Erase Check (CS-37 board)

Mode	Record
Signal	Arbitrary
Measurement Point	Pin ② of CN002 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Above 7.0 MHz Voltage: Above 7.0 Vp-p

Note: Use a MP type tape.

Checking method:

1) Check that the oscillation frequency is above 7.0 MHz and that the oscillation voltage is above 7.0 Vp-p.

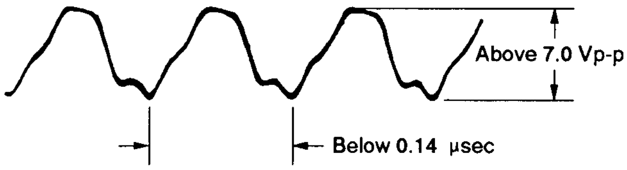


Fig. 9-8.

3. VXO Oscillation Frequency Check (VA-77 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ⑫ of IC301
Measuring Instrument	Frequency counter
Specified Value	4433619 ± 70 Hz

Note: Connect the frequency counter via a high impedance (approximately 10 MΩ) and low capacity (below 10 pF) buffer.

Adjusting method:

1) Check that the oscillation frequency of pin ⑫ of IC301 is 4433619 ± 70 Hz.

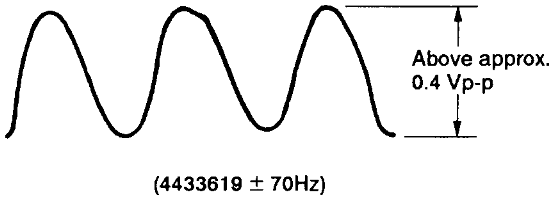


Fig. 9-9.

4. EE Level Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑥ of CN400 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4A (EE LEVEL)
Specified Value	A=1.00 ± 0.025V

Note: Terminate pin ⑥ of CN400 at 75Ω .
After completing adjustment, remove the 75Ω resistor.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

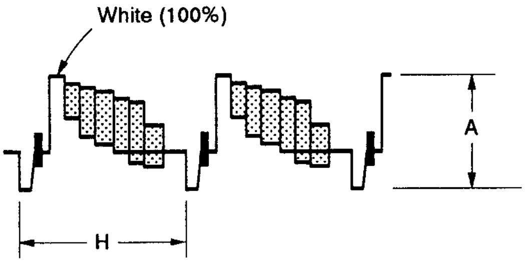


Fig. 9-10.

5. IR Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑦ of IC201 (Y COMB OUT)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	4D (SR IR)
Specified Value	Residual chroma component (A) is minimum (below 80 mVp-p)

Connection

1) Connect pin ⑭ of IC201 (or pin ② of IC205) to pin ㊿ of IC201 with a jumper wire.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4D, and adjust so that the residual chroma component (A) becomes minimum.
3) Press the PAUSE button of the adjusting remote control unit.

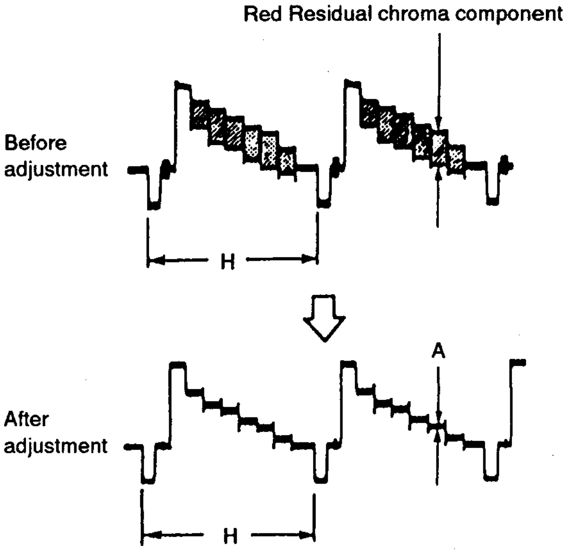


Fig. 9-11.

6. Chroma Comb Filter Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ⑪ of IC201 (C+CD)
Adjusting Element	Oscilloscope
Measuring Instrument	RV051 (Phase)
Adjustment Page	D
Adjustment Address	4C (C COMB)
Specified Value	Residual chroma component (A) is minimum.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4C, and adjust the residual chroma component to minimum.
3) Adjust RV051 so that the residual chroma component (A) becomes minimum.
4) Repeat steps 2) through 3).
5) Press the PAUSE button of the adjusting remote control unit.

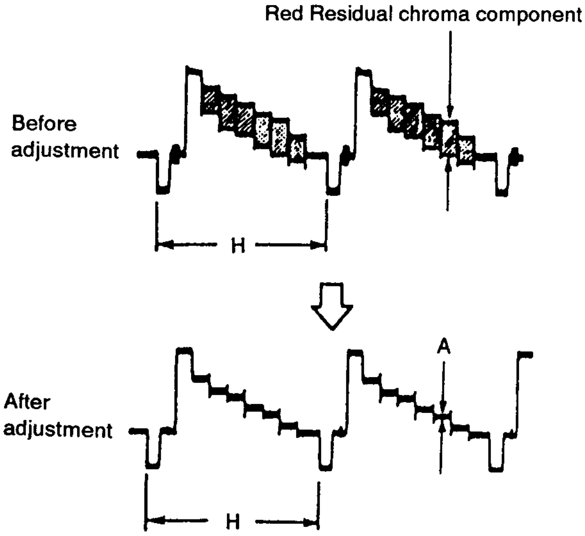


Fig. 9-12.

7. Emphasis Input Level Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar (without burst signal)
Measurement Point	Pin ⑤ of IC206 (or Pin ③ of IC201)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5A (EMPH LVL (EE))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5A, and adjust so that the Y signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

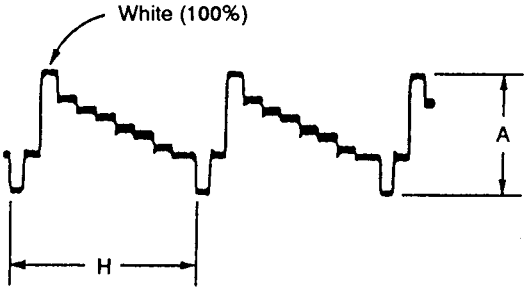


Fig. 9-13.

8. PB Y Level Adjustment (VA-77 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP) Color bar section
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	59 (PB Y (L))
Specified Value	A=0.50 ± 0.025V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Playback the color bar section of the normal mode alignment tape (WR5-5CSP).
3) Change the data of page: D, address: 59, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.

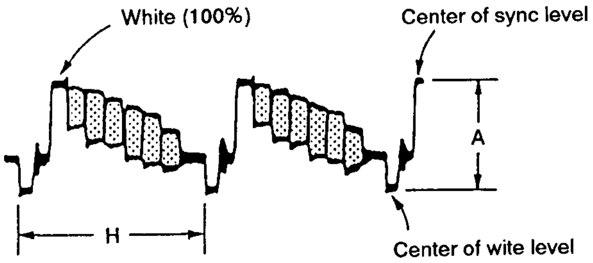


Fig. 9-14.

9. PB LINE OUT Level Adjustment

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP) Color bar section
Measurement Point	Video output terminal (terminated at 75 Ω)
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	5B (EMPH LVL (PB))
Specified Value	A=1.0 ± 0.05V

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 5B, and adjust so that the video signal level (A) becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

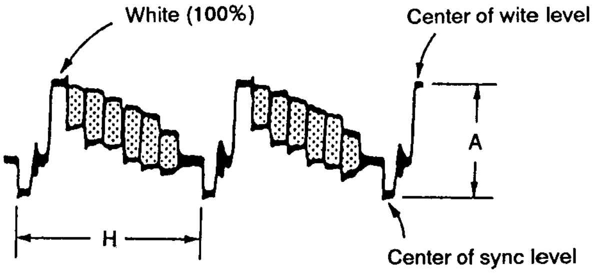


Fig. 9-15.

10. Y FM Carrier Frequency Adjustment (VA-77 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ㊸ of IC201 (Y RF OUT)
Measuring Instrument	Frequency counter
Adjustment Page	D
Adjustment Address	4F (Y FM CARRIER)
Specified Value	4.38 ± 0.04 MHz

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 4F, and adjust so that the Y FM carrier frequency becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Perform "Deviation Adjustment".

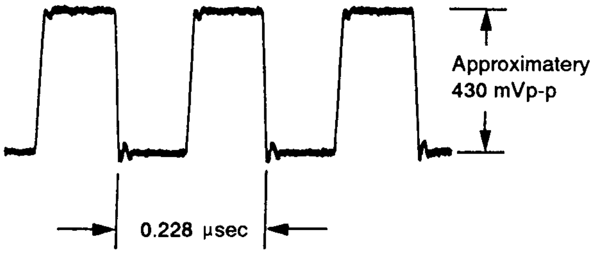


Fig. 9-16.

11. Deviation Adjustment (VA-77 board)

Mode	Record and playback
Signal	Color bar
Measurement Point	Pin ㉑ of IC201
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	51 (Y FM DEVIATION)
Specified Value	A=0.50 ± 0.025V

Note: Check that "Emphasis Input Level Adjustment", "PB Y Level Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Record the color bar signal.
3) Playback the recorded signal.
4) Check the playback signal level (A).
   Specification:A=0.50 ± 0.025V
5) If the specification is not satisfied, change the data of page: D, address: 51, and repeat steps 2 to 4.

Playback signal level	Changing the data
When smaller than the specified value	Increase
When bigger than the specified value	Decrease

6) Press the PAUSE button of the adjusting remote control unit.

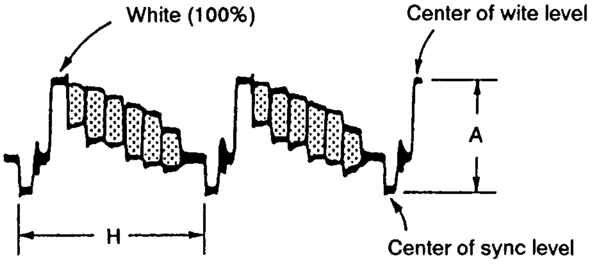


Fig. 9-17.

12. Chroma Emphasis fo Adjustment (VA-77 board)

Mode	Record
Signal	Color bar
Measurement Point	Pin ㉔ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	FL302
Specified Value	Minimum fo component

Adjusting method

1) Adjust FL203 so that the amplitude of the latter section of the chroma signal (yellow section) becomes minimum.

Minimize the amplitude of the latter section of the yellow section.

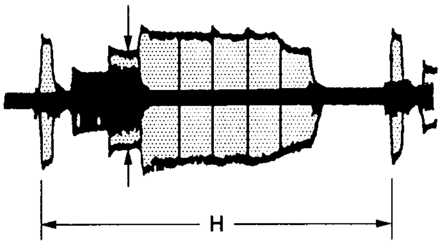


Fig. 9-18.

13. REC Y Level Adjustment (VA-77 board)

Mode	E-E
Signal	No signal
Measurement Point	Pin ⑤ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	55 (REC (MP)), 54 (REC Y (ME))
Specified Value	MP type tape: A=205 ± 5 mVp-p ME type tape: A=185 ± 5 mVp-p

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Insert a MP type cassette tape.
3) Change the data of page: D, address: 55, and adjust so that the Y signal level (A) becomes the specified value.
4) Press the PAUSE button of the adjusting remote control unit.
5) Insert a ME type cassette tape.
6) Change the data of page: D, address: 54, and adjust so that the Y signal level (A) becames the specified value.
7) Press the PAUSE button of the remote control unit.

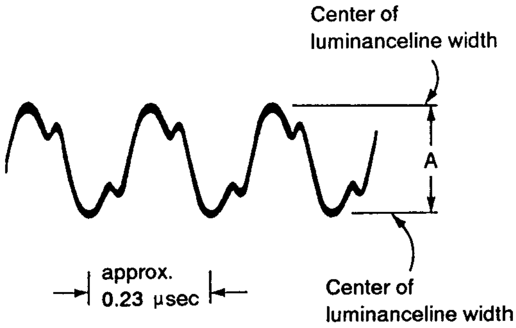


Fig. 9-19.

14. REC C RF Level Adjustment (VA-77 board)

Mode	E-E
Signal	Color bar
Measurement Point	Pin ③ of IC054
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	46 (REC C RF (EE))
Specified Value	A=90 ± 10 mVp-p

Note: Use a MP type tape.

Adjusting method

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 46, and adjust so that the chroma signal level (A) becames the specified value.
3) Press the PAUSE button of the adjusting remote control unit.
4) Set data: 00 to page: D, address: 47, and press the PAUSE button of the adjusting remote control unit.

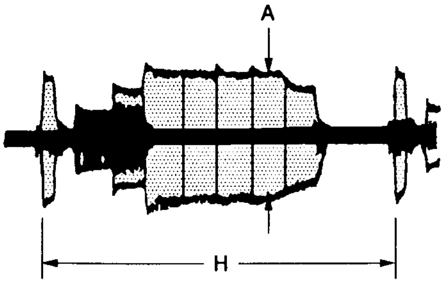


Fig. 9-20.

15. REC ATF Level Checking (CS-37 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑱ of IC501
Measuring Instrument	Oscilloscope
Specified Value	A=600 ± 30 mVp-p

Checking method

1) Confirm that the REC ATF signal level (A) satisfies the specified value.

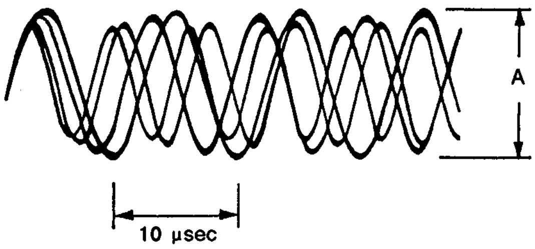


Fig. 9-21.

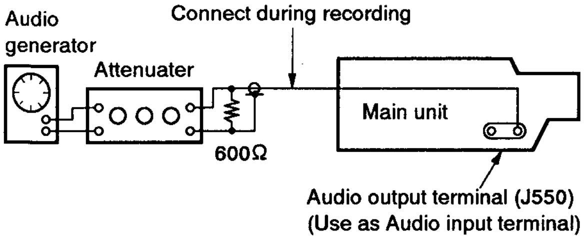
9-6. AUDIO SYSTEM ADJUSTMENT

- Perform the adjustment using the color bar signal as a video signal input.

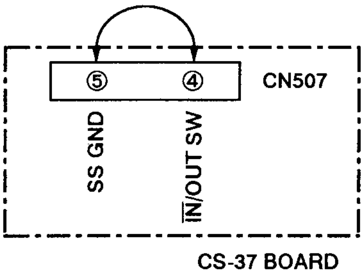
[Connecting the measuring instruments for the audio]

Connect the audio system measuring instruments besides the video system measuring instruments as shown in Fig. 9-22, and perform adjustments with the power switch [player] position.

- Connect the audio generator or the attenuator as shown in the following figure.


Audio generator
Connect during recording
Attenuater
600Ω
Main unit
Audio output terminal (J550)
(Use as Audio input terminal)

Note: To use the audio output terminal as the audio input terminal, connect Pin ④ of CN507 on the CS-37 board to GND with a jumper wire. After adjusting, be sure to disconnect this wire.


⑤
④
CN507
SS GND
IN/OUT SW
CS-37 BOARD

- Connect the audio level meter or the distortion meter as shown in the following figure.

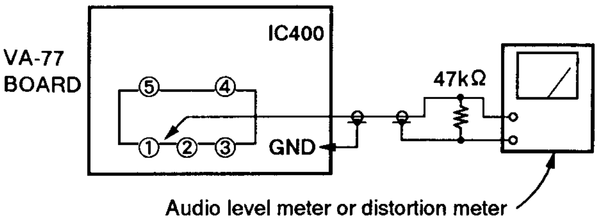

VA-77 BOARD
IC400
⑤
④
①
②
③
GND
47kΩ
Audio level meter or distortion meter

Fig. 9-22

[Adjustment Procedure]

1) Carrier frequency check
2) Recording level check
3) E-E output level check
4) IR adjustment
5) Deviation adjustment
6) Overall level characteristics, distortion check
7) Overall noise level check

1. Carrier Frequency Check (VA-77 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Frequency counter (Note 1)
Specified Value	1.500 ± 0.002 MHz

Note: Use a high impedance (above 1 MΩ) and low capacity (below 20 pF) probe.

Checking method:

1) Check that the 1.5 MHz carrier frequency satisfies the specified value.

2. Record Level Check (VA-77 board)

Mode	Record
Signal	No signal
Measurement Point	Pin ⑤ of CN202 (REC AFM RF)
Measuring Instrument	Oscilloscope
Specified Value	A=340 ± 40 mVp-p

Checking method:

1) Check that the 1.5 MHz carrier level satisfies the specified value.
   (Read the center of the luminance line width and note down the level read.)

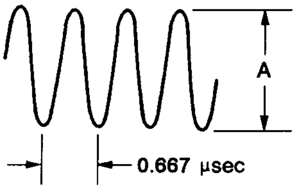


Fig. 9-23.

3. E-E Output Level Check (VA-77 board)

Mode	Record
Signal	400 Hz, -7.5 dBs audio input terminal
Measurement Point	Pin ⑲ of IC401 or Pin ① of IC400
Measuring Instrument	Oscilloscope
Specified Value	925^{+240}_{-190} mVp-p (-7.5 ± 2 dBs)

Checking method:

1) Check that the 400 Hz signal level satisfies the specified value.

4. IR Adjustment (VA-77 board)

Mode	Playback
Signal	Alignment tape: For checking operations (WR5-5CSP)
Measurement Point	+: Pin ⑥ of IC401 –: Pin ㊹ of IC401 (C428 ⊕)
Measuring Instrument	Digital voltmeter
Adjustment Page	D
Adjustment Address	7A (1.5 IR)
Specified Value	The DC voltage difference between pins ㊹ and ⑥ is 0 ± 10 mVdc

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7A and adjust so that the DC voltage becomes 0 ± 10 mVdc.
3) Press the PAUSE button of the adjusting remote control unit.

5. Deviation Adjustment

Mode	Playback
Signal	Alignment tape: For checking the operation (WR5-5CSP)
Measurement Point	Audio output terminal
Measuring Instrument	Oscilloscope
Adjustment Page	D
Adjustment Address	7B (1.5 DEV)
Specified Value	-7.5 ± 0.5 dBs

Adjusting method:

1) Release the protect.
   Page: 1, address: 00, data: 01
2) Change the data of page: D, address: 7B, and adjust so that the 400 Hz signal level becomes the specified value.
3) Press the PAUSE button of the adjusting remote control unit.

6. Overall Level Characteristic, Distortion Check

Mode	Self recording/playback
Signal	400 Hz, –7.5 dBs: Audio input terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter and distortion meter
Specified Value	Level: –7.5 ± 2 dBs Distortion rate: Below 0.5% (Note 1)

Note: 1) Value when the following filter is used

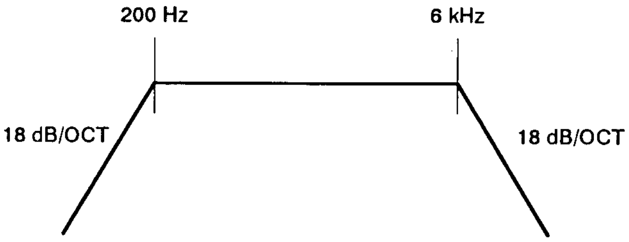


Fig. 9-24.

Checking method:

1) Input the 400 Hz, –7.5 dBs signal to the audio input terminal.
2) Record the signal.
3) Remove the input signal.
4) Playback the recorded section.
5) Check that the 400 Hz signal level of the audio output terminal is –7.5 ± 2 dBs, and that the distortion rate is below 0.5% (Note 1).

7. Overall Noise Level Check

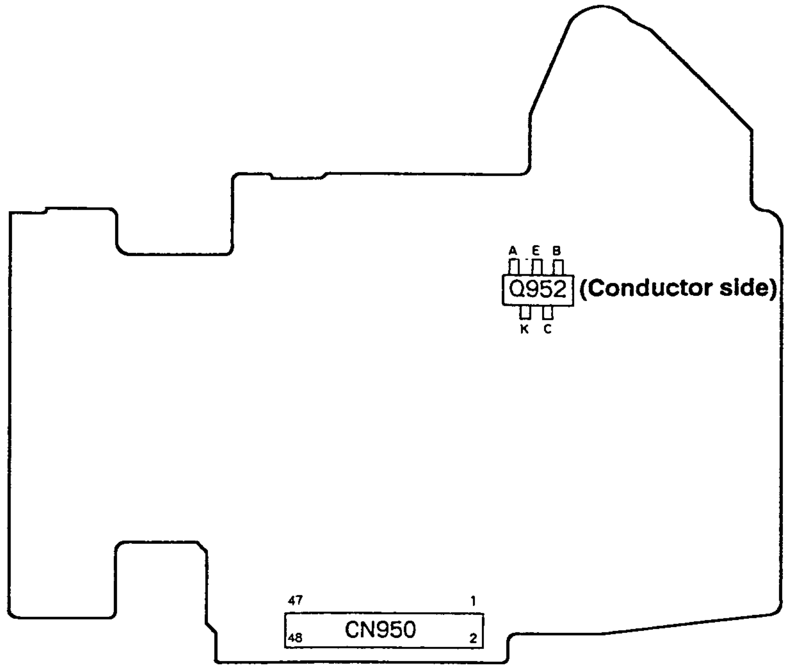
Mode	Self recording
Signal	No signal: Audio output terminal
Measurement Point	Audio output terminal
Measuring Instrument	Audio level meter (Use an IHF-A curve auditory correction filter)
Specified Value	Below –65.0 dBs

Checking method:

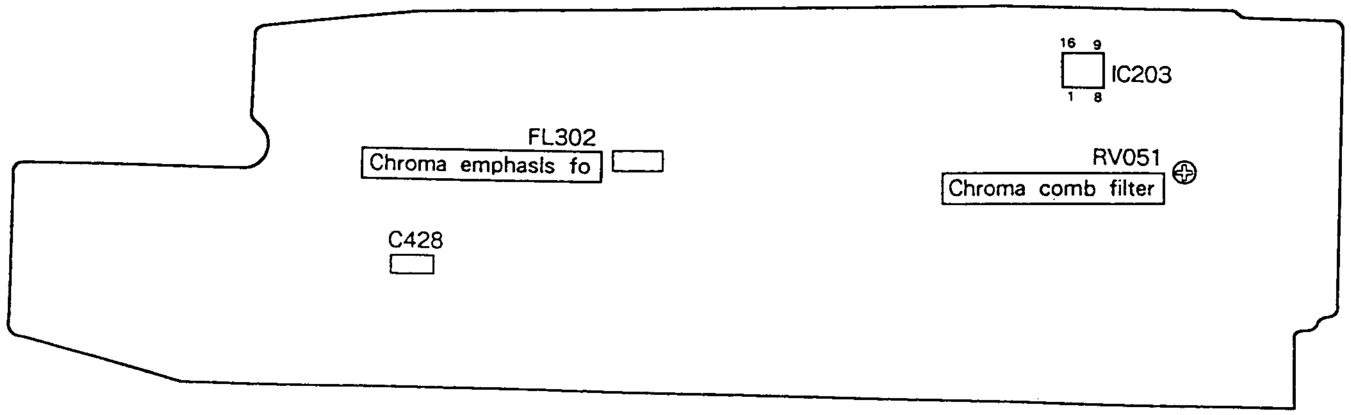
1) Insert the shorting plug to the audio input terminal.
2) Record.
3) Remove the shorting plug.
4) Playback the recorded section.
5) Check that the noise level of the audio output terminal is below –65.0 dBs.

9-7. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

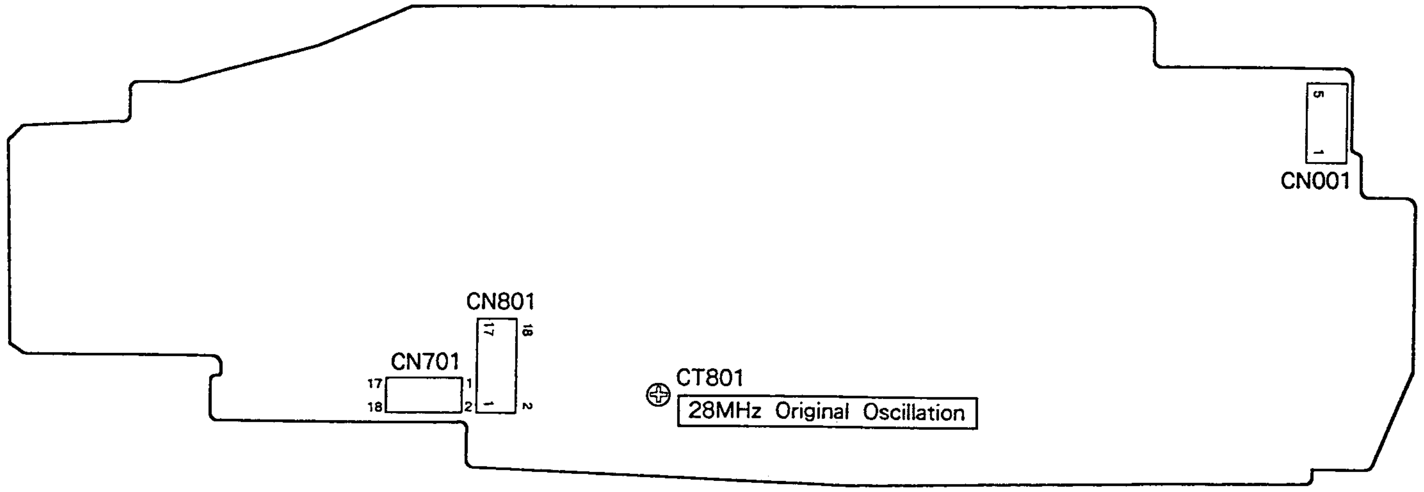
PS-308 BOARD (COMPONENT SIDE)


A E B
Q952 (Conductor side)
K C
47 1
48 CN950 2

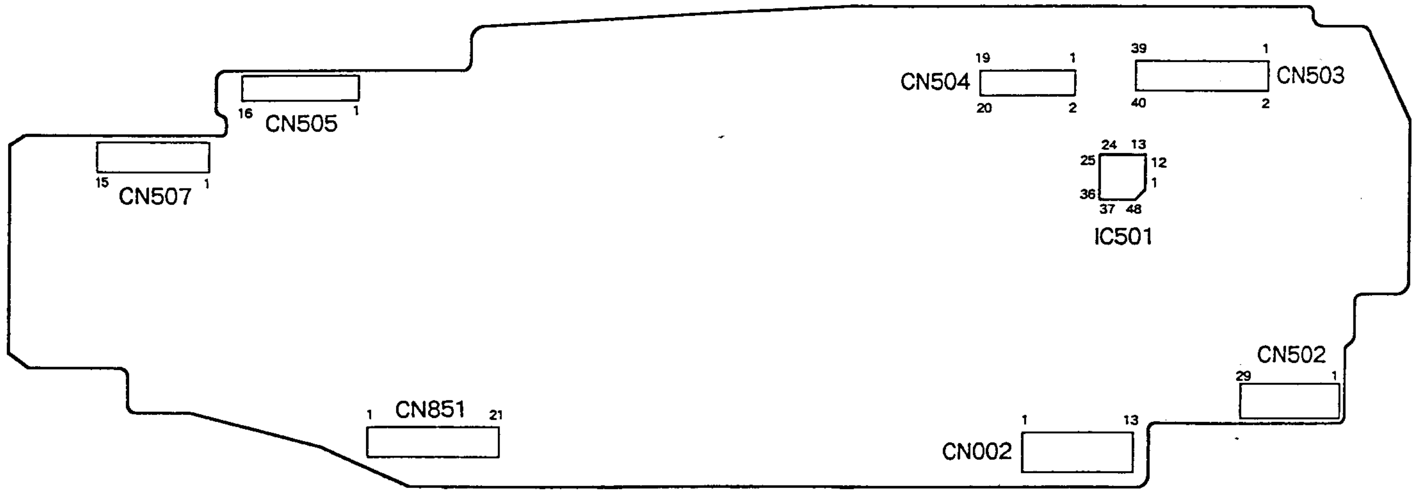
VA-77 BOARD (COMPONENT SIDE)


16 9
IC203
1 8
FL302
Chroma emphasis fo
RV051
Chroma comb filter
C428

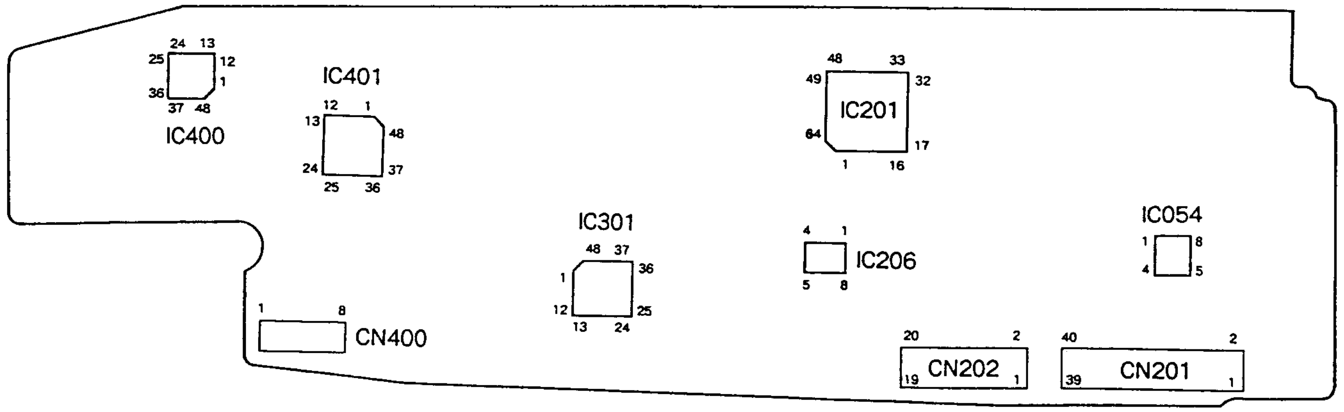
CS-37 BOARD (COMPONENT SIDE)


5
1
CN001
CN801
17 18
1 2
CN701
17 1
18 2
CT801
28MHz Original Oscillation

CS-37 BOARD (CONDUCTOR SIDE)


CN504
19 1
20 2
39 1
CN503
40 2
16 CN505 1
15 CN507 1
24 13
25 12
1
36
37 48
IC501
CN502
29 1
1 CN851 21
1 13
CN002

VA-77 BOARD (CONDUCTOR SIDE)

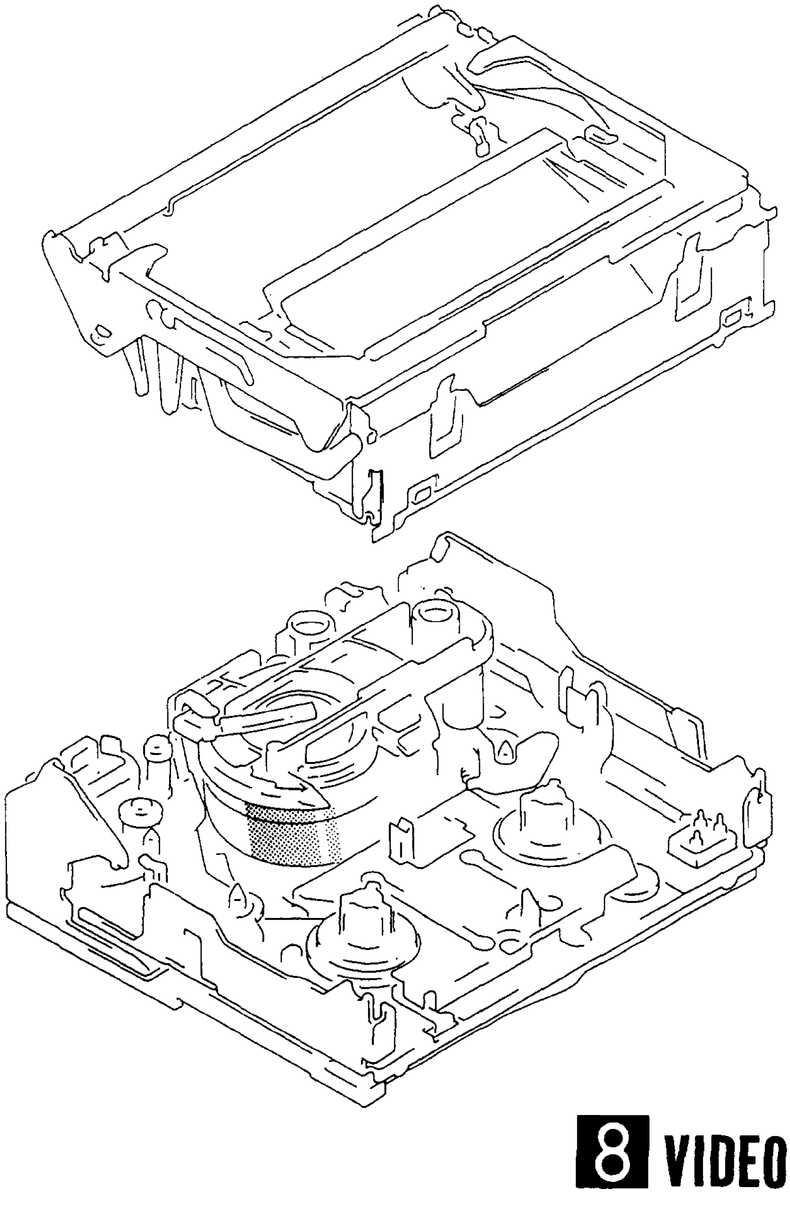

24 13
25 12
1
36
37 48
IC400
IC401
12 1
13 48
24 37
25 36
48 33
49 32
IC201
64 17
1 16
IC301
48 37
1 36
12 25
13 24
4 1
IC206
5 8
IC054
1 8
4 5
1 8
CN400
20 2
19 CN202 1
40 2
39 CN201 1

8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅳ

A MECHANISM

Video 8

File with the SERVICE MANUAL



8 VIDEO RECORDER

SONY®

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1550

1. PREPARATION FOR MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

For removal of the cabinet and boards, refer to "Disassembly" in each Service Manual.
Mechanical adjustment is done in the USE mode. (To select the USE mode, refer to "1-3, Handling of Mode Selector".)

1-1. CASSETTE COMPARTMENT ASSEMBLY

1. Removal (Fig. 1)

1) Select the USE mode.
2) Push the part ⓐ of lock arm ❶ toward the arrow 🅐 to unlock from lock guide ❷, and raise the cassette compartment as shown in Fig. a.
3) Remove two screws ❸ and remove the LS frame ❹ toward the arrow 🅑.
4) With the cassette compartment assembly ❺ pushed in arrow 🅒 direction, distort tabs ⓑ and ⓒ of MD side plate toward the arrow 🅓 to disengage from catches ⓓ and ⓔ of cassette compartment assembly respectively. In such a case, insert a screwdriver between MD side plate and catch and disengage the tab ⓑ first, then disengage the tab ⓒ for easy removal as shown in Fig. b.
5) Raise the cassette compartment assembly ❺ in the opposite direction of arrow 🅒 until the shafts ⓕ and ⓖ are disengaged, and push left and right side plates toward arrow 🅓 to remove the cassette compartment assembly.

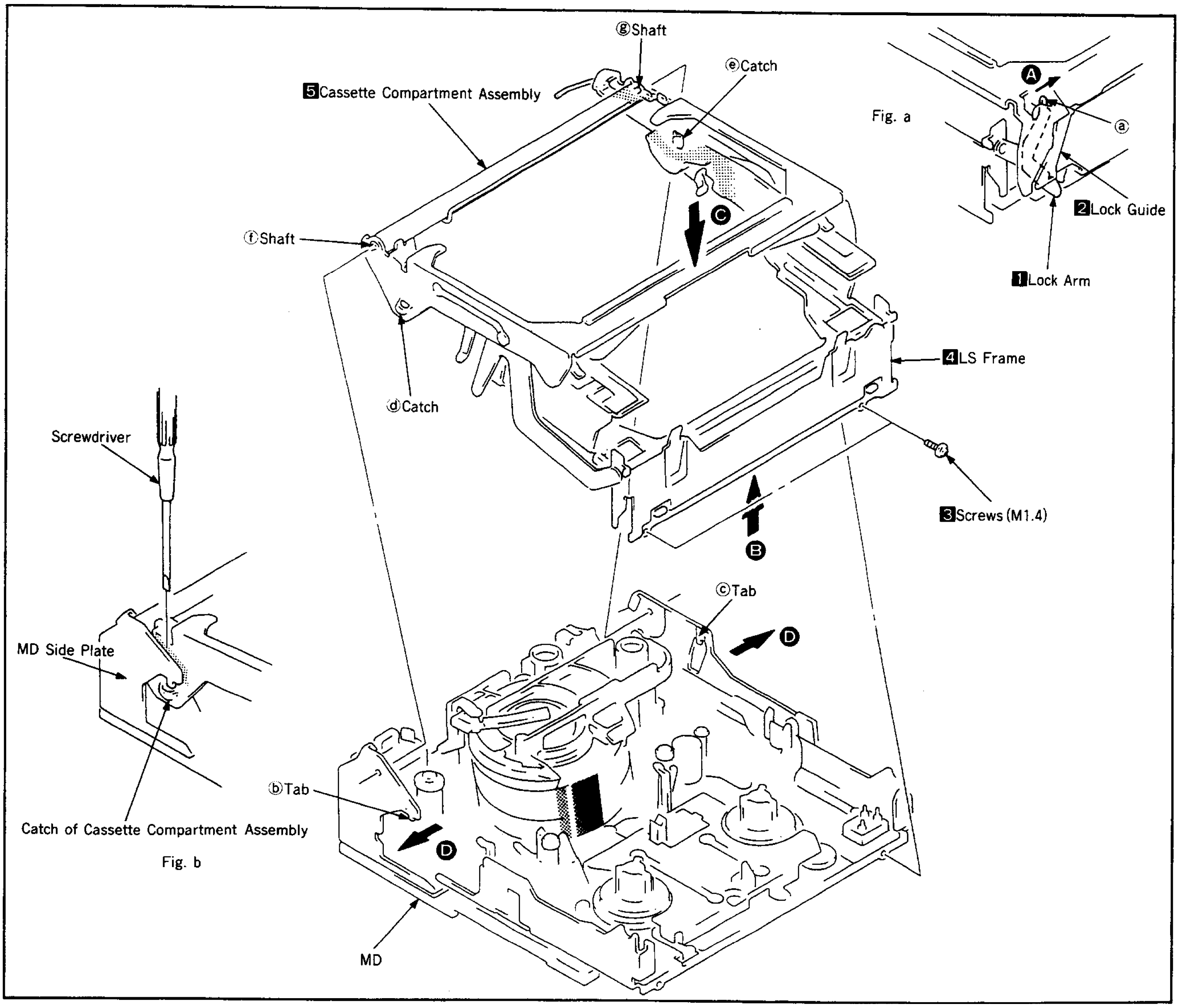

ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
Fig. a
🅐
ⓐ
❷Lock Guide
❶Lock Arm
ⓕShaft
🅒
ⓓCatch
❹LS Frame
Screwdriver
❸Screws (M1.4)
🅑
ⓒTab
🅓
MD Side Plate
ⓑTab
🅓
Catch of Cassette Compartment Assembly
Fig. b
MD

Fig. 1

2. Mounting (Fig. 2)

1) Select the USE mode.
2) Draw the cassette holder ❻ of cassette compartment assembly ❺ toward the arrow Ⓔ, and lower the LS frame ❹ toward the arrow Ⓕ.
3) With the cassette compartment assembly ❺ tilted by about 45° against MD, insert shafts ⓕ and ⓖ of cassette compartment assembly into holes ⓗ and ⓘ of MD side plate respectively.
   At this time, the part ⓙ of torsion bar must be positioned on the side ⓚ of LS flexible board (FP-443) (not on the side ⓛ), as shown in Fig. c.
4) Holding holes ⓗ and ⓘ of MD side plate, press the cassette compartment assembly ❺ so that its catches ⓓ and ⓔ are engaged with tabs ⓑ and ⓒ of MD side plate. In such a case, the lock arm ❶ of cassette compartment assembly must be inserted into a groove in the guide rail ❼ on the MD side plate as shown in Fig. d.
5) Insert left and right side plates ⓜ and ⓝ of LS frame ❹ inside the LS chassis ❽.
6) Push down the cassette compartment to lock.

Note : Make sure that the shafts ⓕ, ⓖ and the tabs ⓞ, ⓟ are set in the MD side plate properly.

7) Tighten two screws ❸.

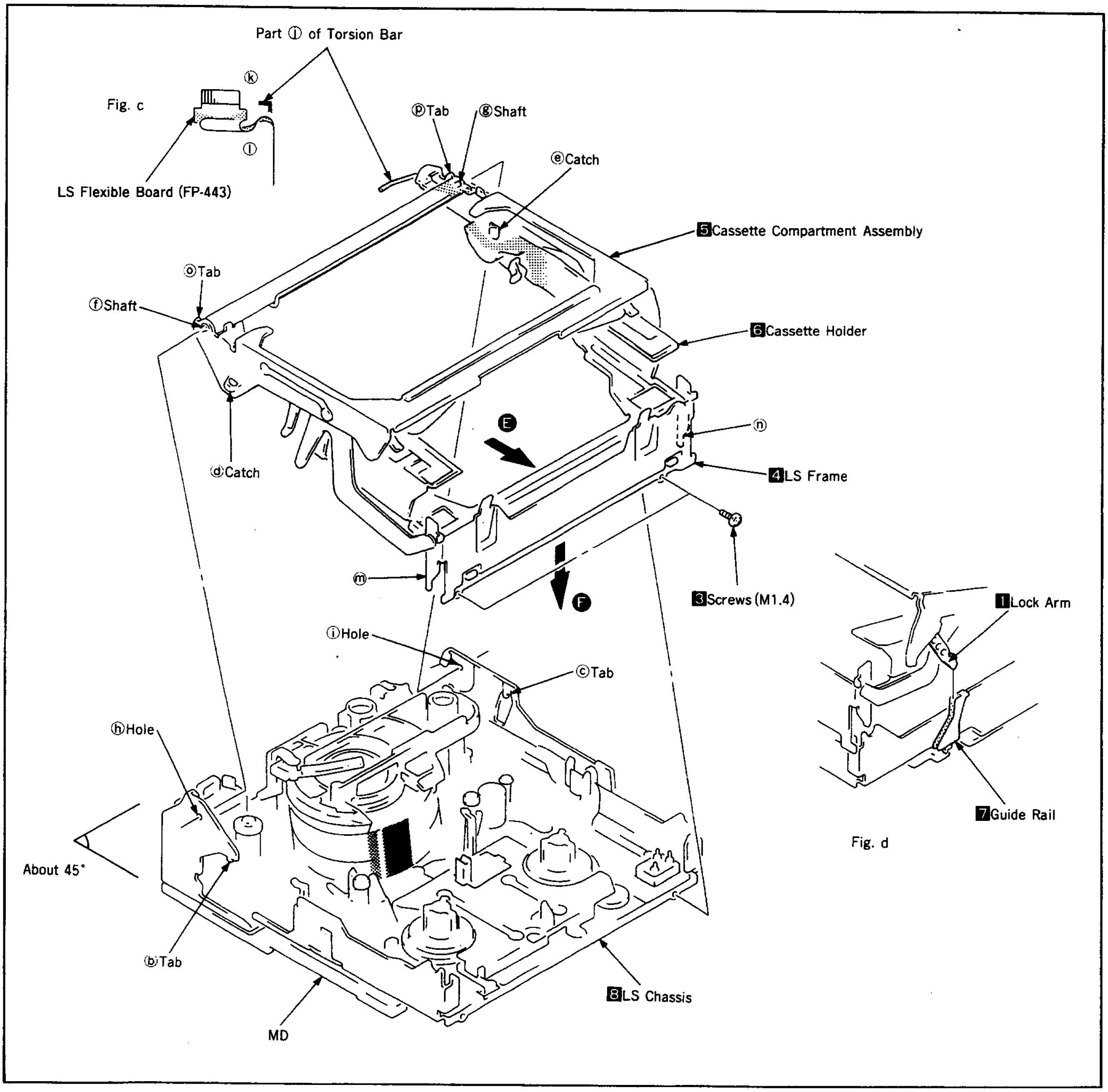

Part ⓙ of Torsion Bar
Fig. c
ⓚ
ⓛ
LS Flexible Board (FP-443)
ⓟTab
ⓖShaft
ⓔCatch
❺Cassette Compartment Assembly
ⓞTab
ⓕShaft
❻Cassette Holder
Ⓔ
ⓝ
ⓓCatch
❹LS Frame
ⓜ
Ⓕ
❸Screws (M1.4)
❶Lock Arm
ⓘHole
ⓒTab
ⓗHole
❼Guide Rail
Fig. d
About 45°
ⓑTab
❽LS Chassis
MD

Fig. 2

1-2. OPERATION WITH CASSETTE COMPARTMENT ASSEMBLY REMOVED (Fig. 3)

1) Referring to the Service Manual, supply power with the cabinet and camera removed. (Make the mechanical deck ready to operate.)
2) Place the cap 2 on the Reflector C 1.
3) Press the pin of the push switch 3 (ON state) and fix it with adhesive tape 4 in that state.

Note : Press the asterisked (*) pin to set the REC mode.
(This is not required for the other modes.)

4) Push the cassette compartment DOWN switch 5 in an arrow direction as shown in Fig. a.

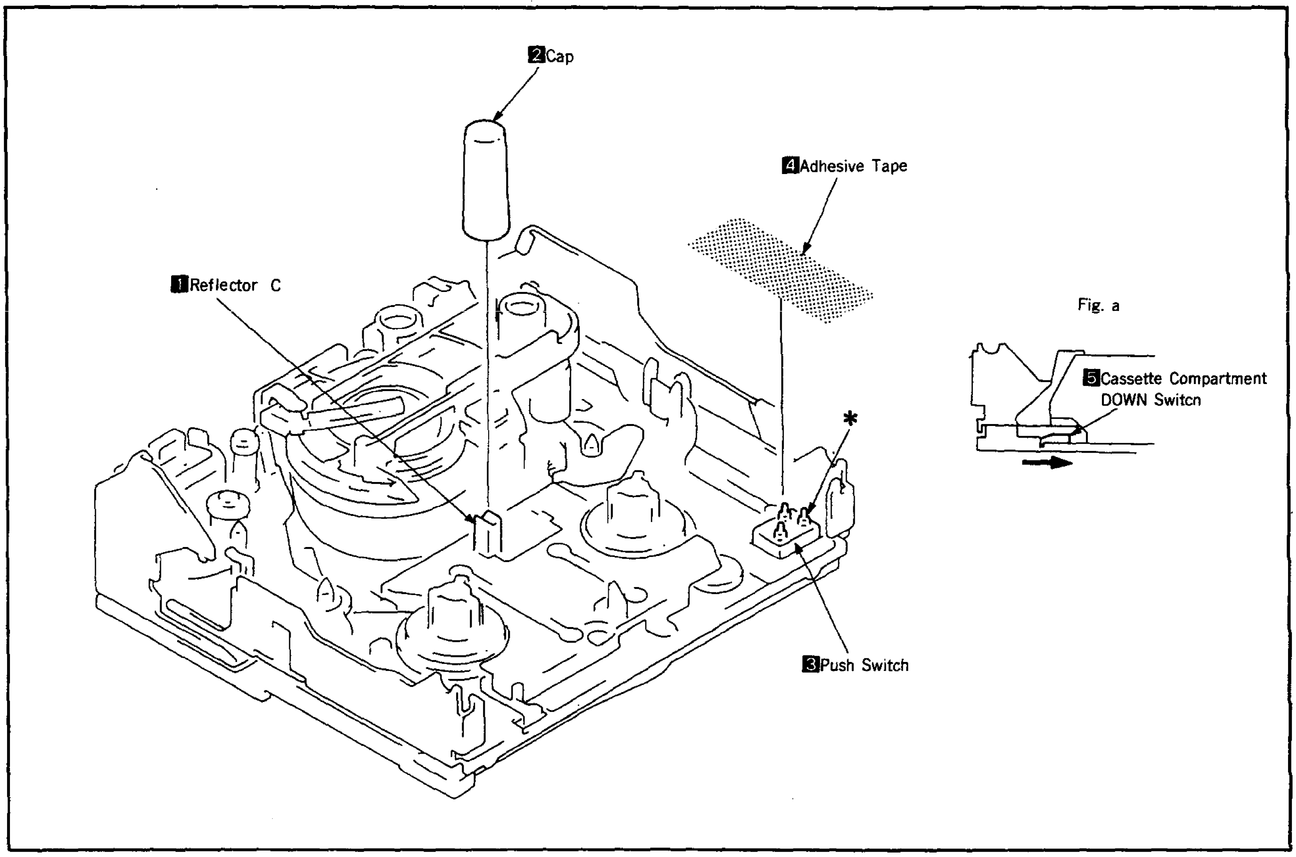

2 Cap
4 Adhesive Tape
1 Reflector C
*
3 Push Switch
Fig. a
5 Cassette Compartment DOWN Switcn

Fig. 3

1-3. HANDLING OF MODE SELECTOR

- Stick the MD process table label to the mode selector IV panel, then mount the panel on the mode selector.
  U,U', FL, O, O' and A mechanisms have different mode indications respectively. Select your disired type. (Fig.4)

1 Construction (Fig.5)

2 Connection (Fig.6)

For CCD-FX410 series

1) Insert the FP-425 flexible connector ❶ and M-SW connector ❷ into the mode selector IV conversion connector ❸ respectively.

3. Handling

1) Use the M mode selector buttons only.
2) During mode selection, "BLANK" lights up when no mode is being selected.
3) If the right M mode selector button is kept pressed, END, EJECT, USE, LOAD, READY,TURN, REC and FF light up in that order.
4) When changing over from the FF mode back to the END mode, press the left M mode selector botton to select your desired mode.

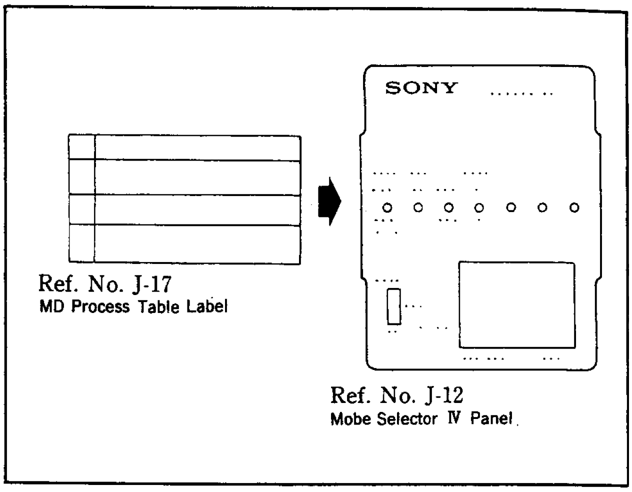

SONY
Ref. No. J-17
MD Process Table Label
Ref. No. J-12
Mobe Selector IV Panel

Fig. 4

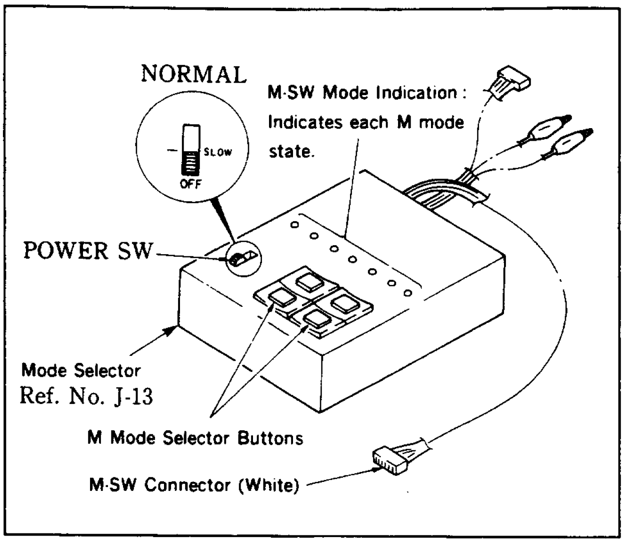

NORMAL
SLOW
OFF
M-SW Mode Indication : Indicates each M mode state.
POWER SW
Mode Selector
Ref. No. J-13
M Mode Selector Buttons
M-SW Connector (White)

Fig. 5

For CCD-FX410 series

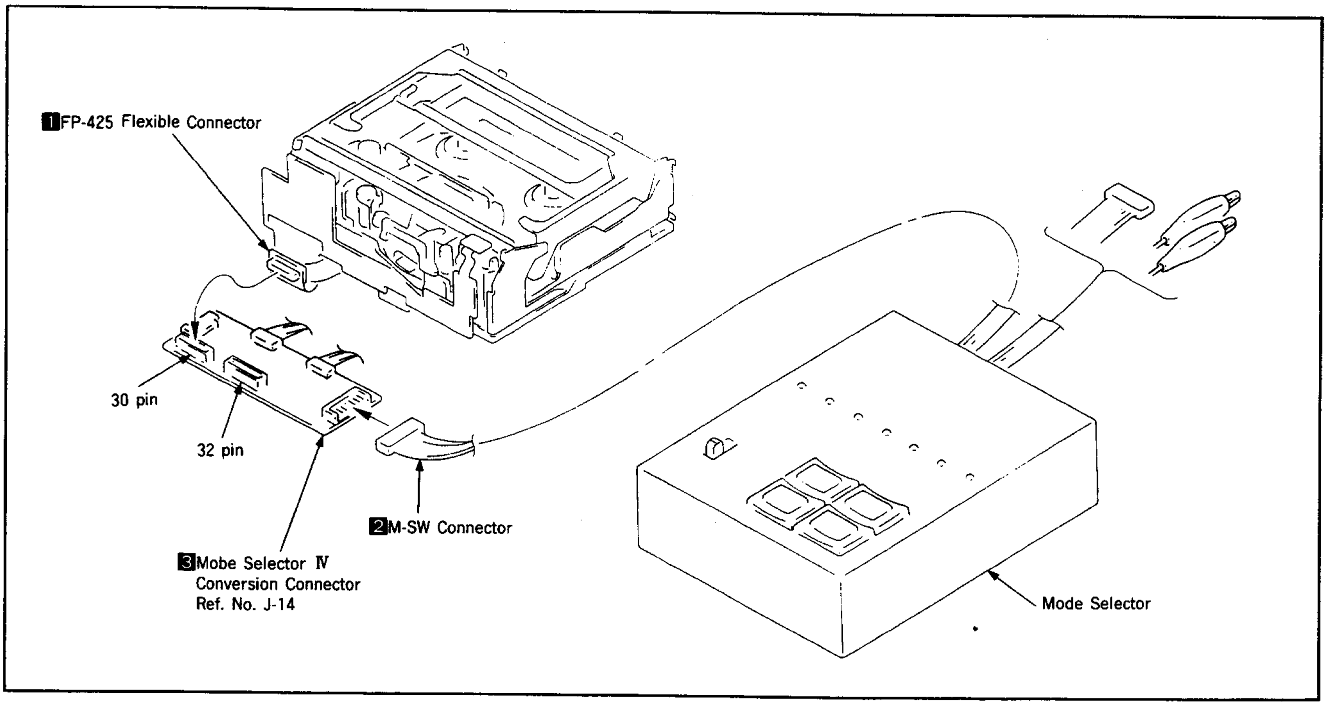
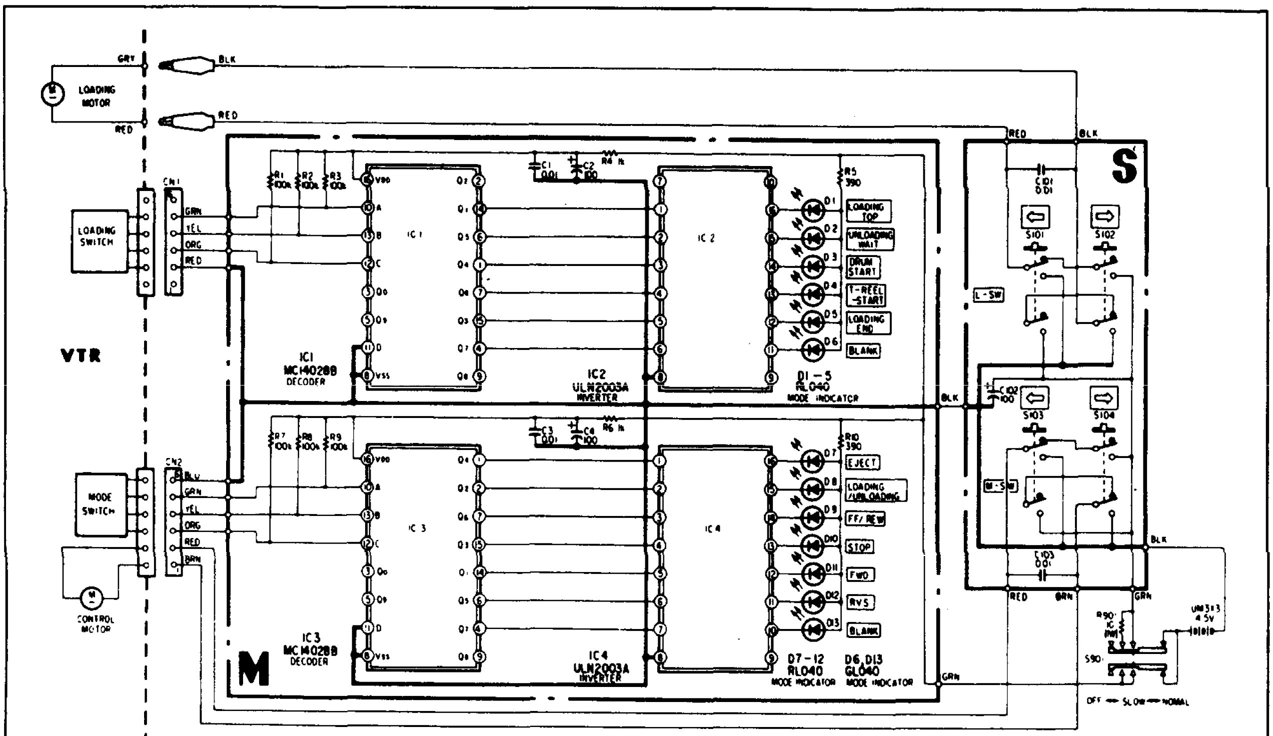

❶FP-425 Flexible Connector
30 pin
32 pin
❷M-SW Connector
❸Mobe Selector IV Conversion Connector Ref. No. J-14
Mode Selector

Fig. 6

1-4. MODE SELECTOR SCHEMATIC DIAGRAM


GRY
BLK
RED
LOADING MOTOR
CN1
GRN
YEL
ORG
RED
LOADING SWITCH
VTR
R1 100k
R2 100k
R3 100k
C1 0.01
C2 100
R4 1k
R5 390
IC1
MC14028B
DECODER
IC2
ULN2003A
INVERTER
D1
D2
D3
D4
D5
D6
LOADING TOP
UNLOADING WAIT
DRUM START
T-REEL -START
LOADING END
BLANK
D1-5
RL040
MODE INDICATOR
CN2
BLU
BRN
MODE SWITCH
CONTROL MOTOR
R7 100k
R8 100k
R9 100k
C3 0.01
C4 100
R6 1k
R10 390
IC3
MC14028B
DECODER
IC4
ULN2003A
INVERTER
M
D7
D8
D9
D10
D11
D12
D13
EJECT
LOADING /UNLOADING
FF/REW
STOP
FWD
RVS
BLANK
D7-12
RL040
MODE INDICATOR
D6, D13
GL040
MODE INDICATOR
S
C101 0.01
S101
S102
L-SW
C102 100
S103
S104
M-SW
C103 0.01
RED
BLK
GRN
R901 10 (1W)
UM3×3 4.5V
S901
OFF ← SLOW ← NOMAL

M-SW (IC3)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	FWD	D11
0	1	0	LOADING/UNLOADING	D8
0	1	1	STOP	D10
1	0	0	EJECT	D7
1	0	1	RVS	D12
1	1	0	FF/REW	D9
1	1	1	BLANK	D13

0: INPUT LEVEL L
1: INPUT LEVEL H

L-SW (IC1)

DECODER INPUT			MODE	LED NO
C	B	A		
0	0	0		
0	0	1	LOADING TOP	D1
0	1	0		
0	1	1	LOADING END	D5
1	0	0	DRUM START	D3
1	0	1	UNLOADING WAIT	D2
1	1	0	T-REEL-START	D4
1	1	1	BLANK	D6

SWITCH		DIRECTION OF MOTOR REVOLUTION
⇦	⇨	
OFF	OFF	STOP
ON	OFF	⇦
OFF	ON	⇨

⇦ L-SW LOADING END ← LOADING TOP
M-SW RVS ← EJECT

⇨ L-SW LOADING TOP ← LOADING END
M-SW EJECT ← RVS

1-5. MODE SELECTOR PARTS LIST

Ref. No	Part No.	Description
		CAPACITOR
C1	1-108-579-00	MILER 0.01μF 50V
C2	1-123-333-00	ELECT 100μF 24V
C3	1-108-579-00	MILER 0.01μF 50V
C4	1-123-333-00	ELECT 100μF 24V
C101	1-108-579-00	MILER 0.01μF 50V
C102	1-123-333-00	ELECT 100μF 24V
C103	1-108-579-00	MILER 0.01μF 50V
		DIODE
D1	8-719-812-31	DIODE TLR123
D2	8-719-812-31	DIODE TLR123
D3	8-719-812-31	DIODE TLR123
D4	8-719-812-31	DIODE TLR123
D5	8-719-812-31	DIODE TLR123
D6	8-719-812-33	DIODE TLG123A
D7	8-719-812-31	DIODE TLR123
D8	8-719-812-31	DIODE TLR123
D9	8-719-812-31	DIODE TLR123
D10	8-719-812-31	DIODE TLR123
D11	8-719-812-31	DIODE TLR123
D12	8-719-812-31	DIODE TLR123
D13	8-719-812-33	DIODE TLG123A

Ref. No	Part No.	Description
		IC
IC1	8-752-240-28	IC TC4028BP
IC2	8-752-120-03	IC μPA2003C
IC3	8-759-240-28	IC TC4028BP
IC4	8-759-120-03	IC μPA2003C
		RESISTOR
R1	1-247-179-00	CARBON 100K 1/4W
R2	1-247-179-00	CARBON 100K 1/4W
R3	1-247-179-00	CARBON 100K 1/4W
R4	1-247-131-00	CARBON 1K 1/4W
R5	1-247-121-00	CARBON 390 1/4W
R6	1-247-131-00	CARBON 1K 1/4W
R7	1-247-179-00	CARBON 100K 1/4W
R8	1-247-179-00	CARBON 100K 1/4W
R9	1-247-179-00	CARBON 100K 1/4W
R10	1-247-121-00	CARBON 390 1/4W
R901	1-214-594-00	METAL 10 1W

2. PERIODIC CHECK AND MAINTENANCE

- Carry out the following maintenance and periodic checks in order not only to fully exhibit the functions and performance of the set, but also for the equipment and tape. After repairing, service the set as follows, regardless of the length of use.

2-1. CLEANING OF ROTARY DRUM ASSEMBLY

1) Gently apply chamois cloth (Ref. No. J-2) soaked in cleaning liquif (Ref. No.J-1) to the rotary drum assembly.
   Clean it by rotating the upper rotary drum assembly slowly counterclockwise by hand.

Note : Do not rotate the motor by power or rotate the upper rotary drum assembly clockwise by hand. Also, the head tip is highly likely to be damaged if the chamois cloth is moved in a pependicular direction to the it. make sure to follow the instructions above for cleaning the rotarydrum assembly.

2-2. CLEANING OF TAPE PATH (Fig.7)

1) In the USE mode, clean the tape running system (TG - 1,- 2,- 3,- 4,- 5, - 6, - 7, pinch roller, and capstan shaft) and the lower drum, using a super fine applicator (Ref. No. J - 3) soaked in the cleaning liquid.

Note : Note that no oil or grease of each link mechanism adheres to the super fine applicator (Ref. No. J - 3).

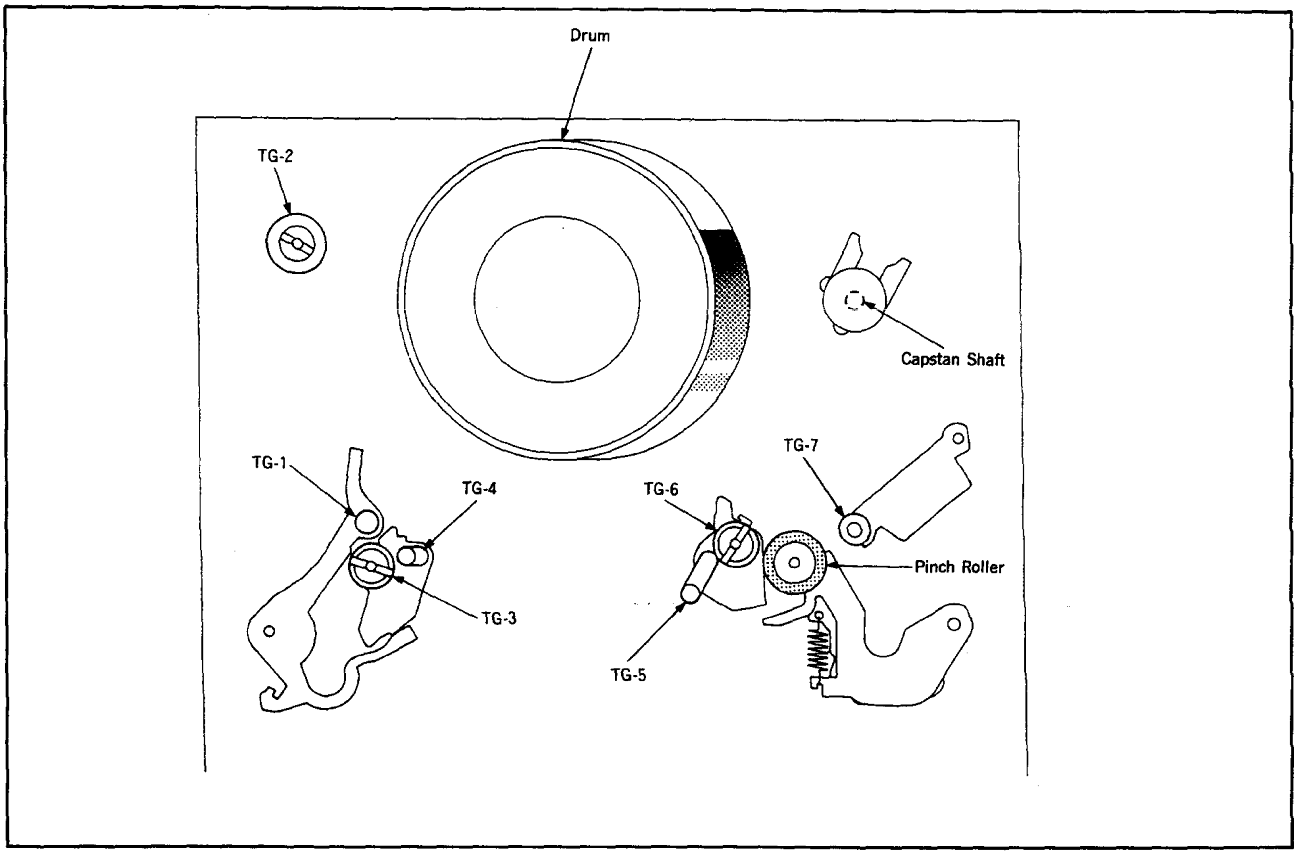


Fig. 7

2-3. PERILDIC CHECK ITEMS

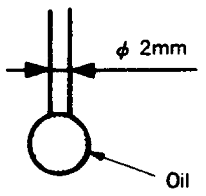
Location of Maintenance and check		Hours of Use (H)										Remarks
		500	1000	1500	2000	2500	3000	3500	4000	4500	5000	
Tape trans-portion System	Cleaning of tape path surface	○	○	○	○	○	○	○	○	○	○	Be careful of oil
	Cleaning and degaussing of rotary assembly	○	○	○	○	○	○	○	○	○	○	Be careful of oil
Driving System	Relay belt	—	☆	—	☆	—	☆	—	☆	—	☆	3-944-539-01
	Capstan shaft	—	◎	—	◎	—	◎	—	◎	—	◎	Be adsolutely careful not to get oil on the tape path surface.
	Relay pulley shaft	—	◎	—	◎	—	◎	—	◎	—	◎	
	Loading motor	—	☆	—	☆	—	☆	—	☆	—	☆	A-7040-304-A
Performance Confirmation	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	—	☆	—	☆	—	☆	—	☆	—	☆	
	Brake system	—	☆	—	☆	—	☆	—	☆	—	☆	
	FWD. RVS torque measurement	—	☆	—	☆	—	☆	—	☆	—	☆	

○ : Cleaning ◎ : Oil ☆ : Confirmation

Note : When overhauling, refer to the items above to replace parts.

Note : Concerning oil

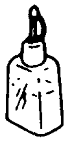
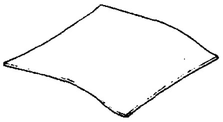
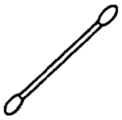
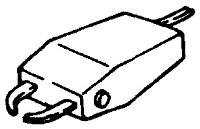
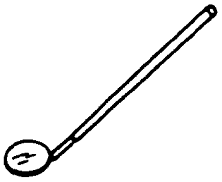
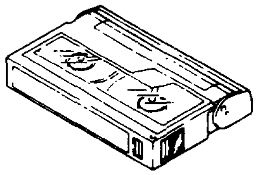
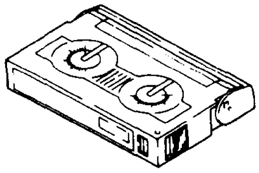
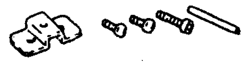
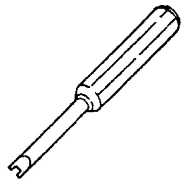
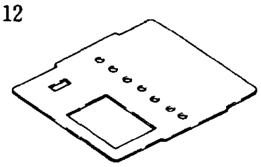
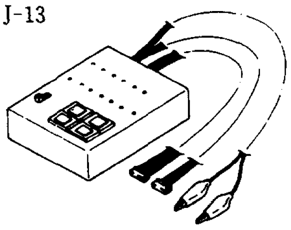
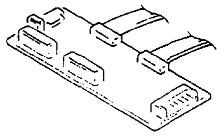
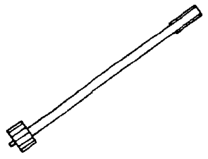
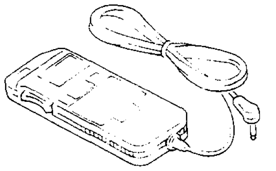
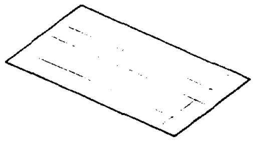
- Be sure to use specified oil. (If you use oil with different viscosity, etc., it may cause troubles.)
  Oil : Part No. 7-661-018-18 (Mitsubishi Diamond Oil Hydrofluid NT - 68)
- When lubricating bearings, be sure use oil free from dust, etc. (If you use oil with dust, etc. contained, it may cause bearings to be worn out or seized.)
- A drip of oil refers to an amount attached to the tip of a ϕ 2mm stick shown in the right figure.



2-4. Service jigs list

Ref. No.	Name	Part No.	Fixture No.	Usage and Others
J-1	Cleaning fluid	Y-2031-001-0		
J-2	Chamois cloth	2-034-697-00		
J-3	Super fine applicator (Made by NIPPON APPLICATOR, P752D)			
J-4	Head degausser	Widely available		
J-5	Small mirror for adjustment Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-6	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-9	FWD and RVS winding torque cassette	J-6080-824-A	GD-2086	
J-10	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-11	Screwdriver for tape path	J-6082-026-A		For tape guide adjustment
J-12	Mode selector IV panel	J-6082-105-A		
J-13	Mode selector	J-6080-825-A		For all models
J-14	Mode selector IV conversion connector	J-6082-167-A		
J-15	FWD B.T. adjusting driver	J-6082-182-A		
J-16	Adjusting remote controller	J-6082-053-B		Tape path (Setting of PATH mode)
J-17	MD process table label	J-6082-166-A		

Other equipment
- ● Oscilloscope
- ● Analog tester (20 kΩ)

J-1 	J-2 	J-3 	J-4 
J-5 	J-6 	J-9 	J-10  **(Attached to the maintenance rotary upper drum)**
J-11 	J-12 	J-13 	J-14 
J-15 	J-16 	J-17 	

3. MECHANICAL CHECK, ADJUSTMENT AND REPLACEMENT

Note : Use the mode selector (Ref. No. J-13) for the following mechanical checks, adjustments and replacements.

Note : The modes in ☐ are those set by pressing the mode selector buttons.

3-1. RETAINER, GOOSENECK ASSEMBLY (Fig. 8)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove a screw ❶.
3) Remove the Retainer, Gooseneck assembly ❷.

2. Mounting

1) Mount the Retainer, Gooseneck assembly ❷ with its two tabs and holes of LS chassis engaged with its hole and a boss of LS chassis.
2) Tighten the screw ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

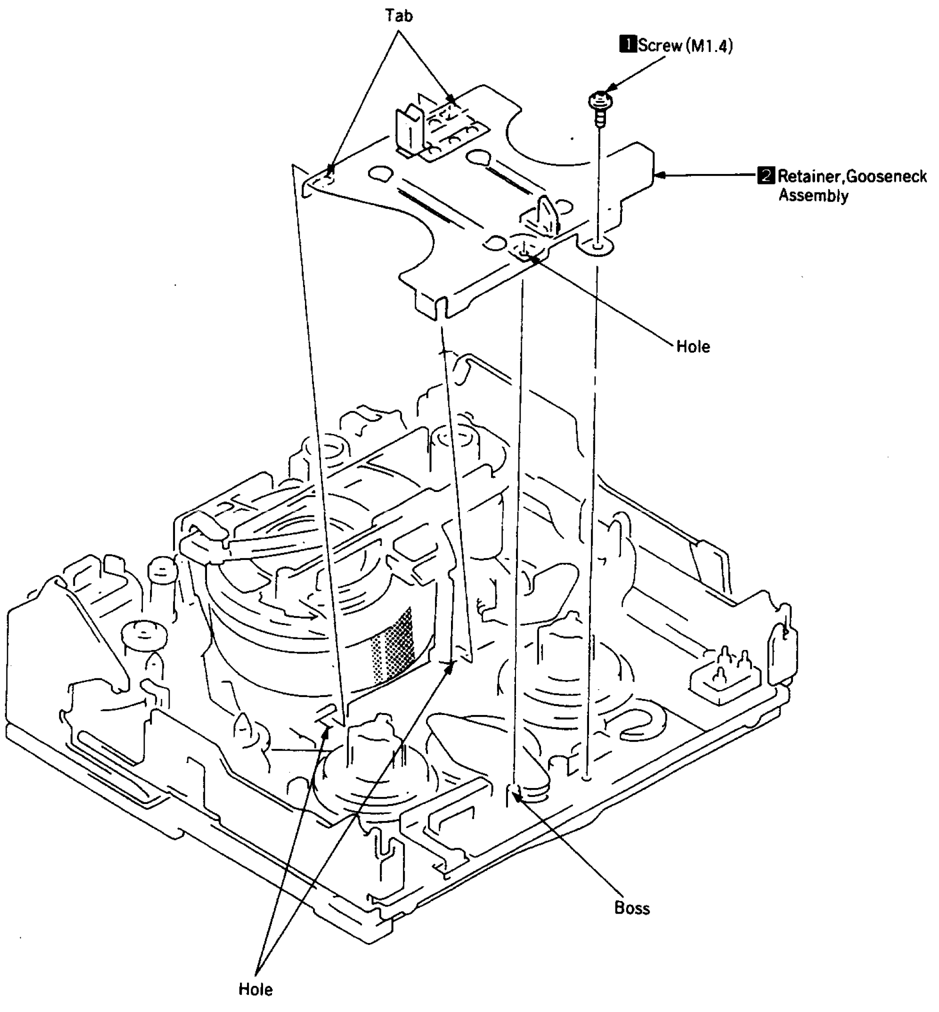


Fig. 8

3-2. PROTECTOR BASE ASSEMBLY (Fig. 9)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screws ❶, then the protector base assembly ❷.

2. Mounting

1) Mount the protector base assembly ❷ with its three holes engaged with two dowels of mechanical chassis, and a dowel of TG-5 Base Holder ❸.
2) Tighten two screws ❶.
3) Referring to 1-1, mount the cassette compartment assembly.

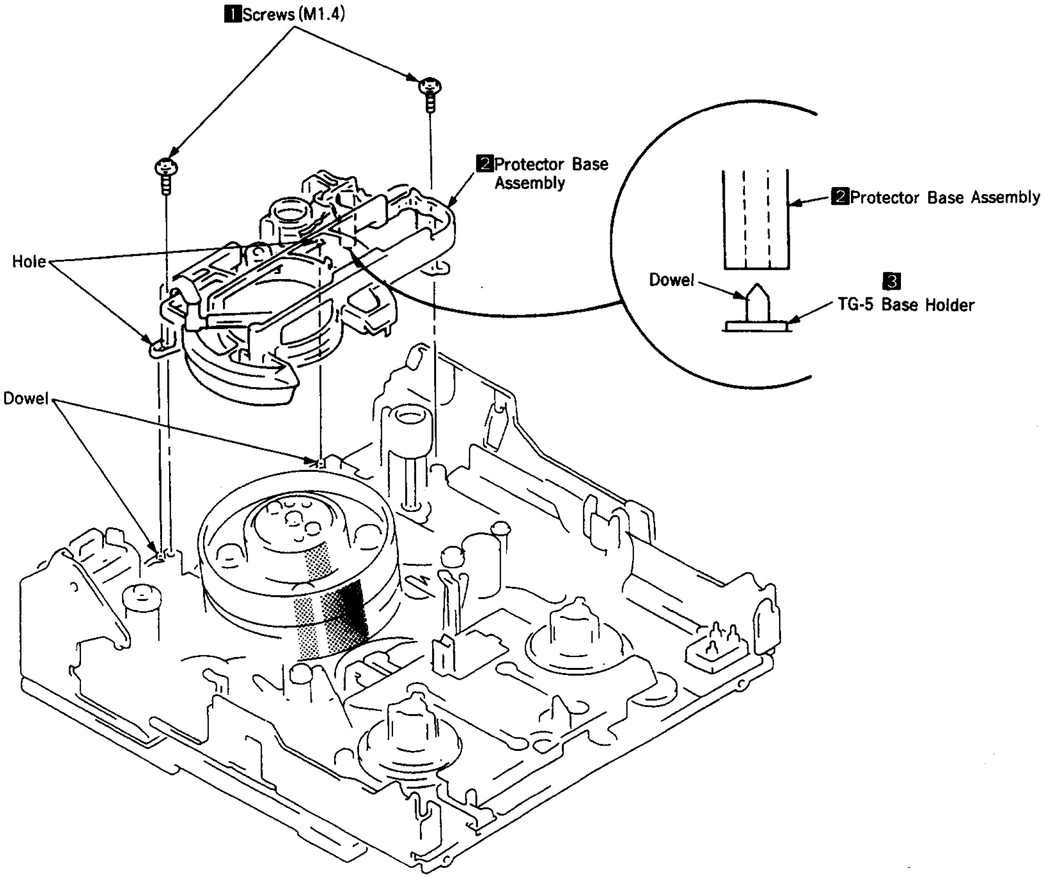

❶Screws (M1.4)
❷Protector Base Assembly
Hole
Dowel
❷Protector Base Assembly
Dowel
❸
TG-5 Base Holder

Fig. 9

3-3. DRUM ASSEMBLY (Fig. 10)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-2, remove the protect base assembly.
3) Disconnect the connector of FP-444 flexible board 1 on the back of MD.
4) Remove three screw 2, then the drum assembly 3.

Note : Do not touch the outer surfaced of drum (hold portions Ⓐ and Ⓑ of drum).

2. Mounting

1) Mount the drum assembly 3 while aligning with two dowels ⓐ of chassis.

Note : Do not touch the outer surfaced of drum (hold portions Ⓐ and Ⓑ of drum).

2) Tighten three screw assemblies 2 in the order of 1, 2 and 3.

Note : Tighten lightly not to deform the drum lead.

3) Apply a screw locking agent to prevent screws ftom loosening.

Note : In tightening the screws, pushing down the drum extremely will allow the drum to float up.

4) Connect the connector of FP-444 flexible board 1 on the back of MD.
5) Referring to 3-2, mount the protect base assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

Note : After mounting, make tape path adjustment in Section 4.

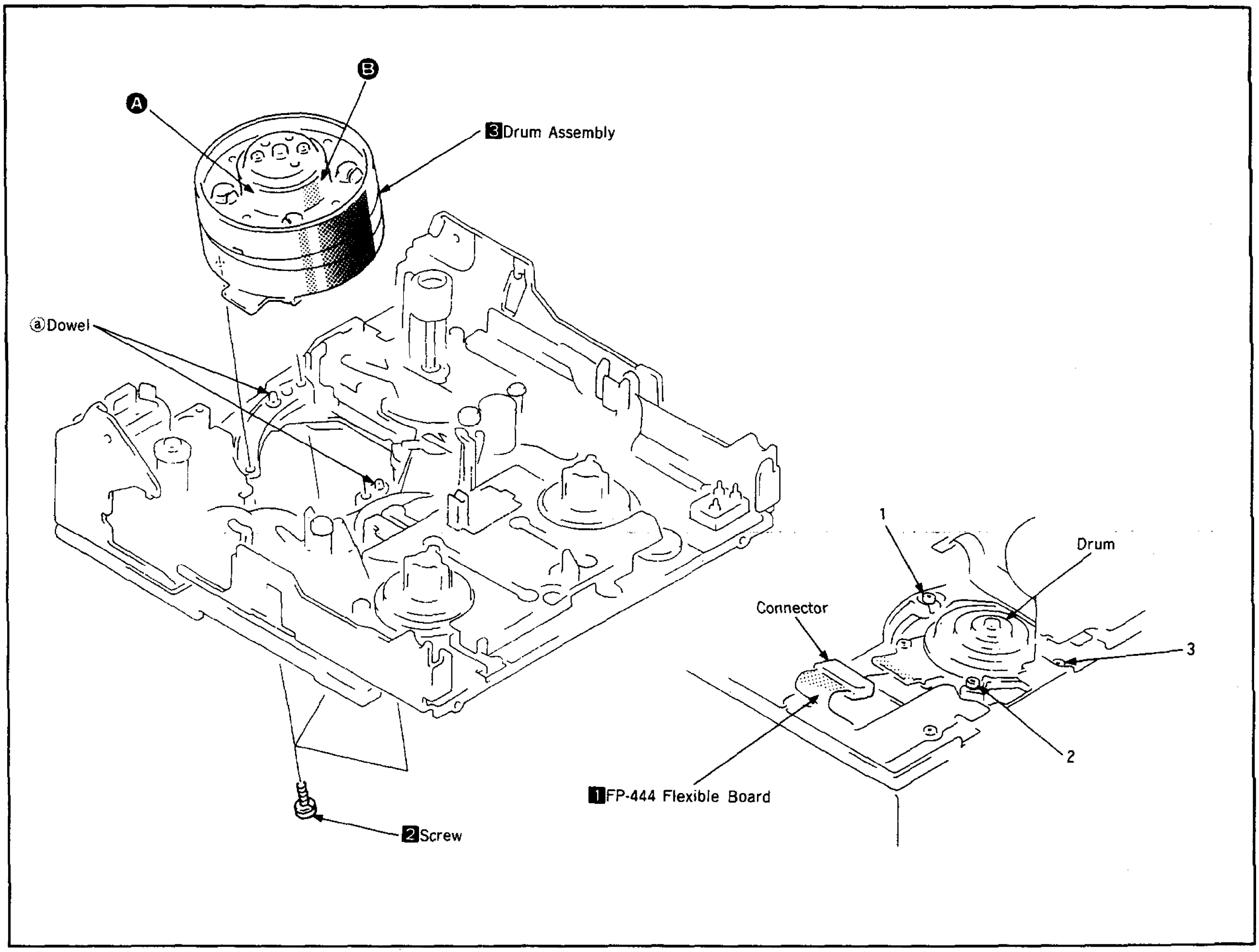


Fig. 10

3-4. CAPSTAN MOTOR ASSEMBLY (Fig. 11)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Remove two screw 1, then the capstan cover 2.
3) Remove the screw 3, then the capstan motor assembly 4.

2. Mounting

1) Mount the capstan motor assembly 4 and tighten the screw 3.

Note : In mounting the capstan motor assembly, hold lightly the capstan motor assembly until the rotor gear aligns with the change gear Assy, then insert fully the assembly when both gears are engaged completely by manually rotating the rotor. (Take care not to damage the change gear Assy.)

2) Mount the capstan cover 2 and tighten two screws 1.
3) Referring to 1-1, mount the cassette compartment assembly.

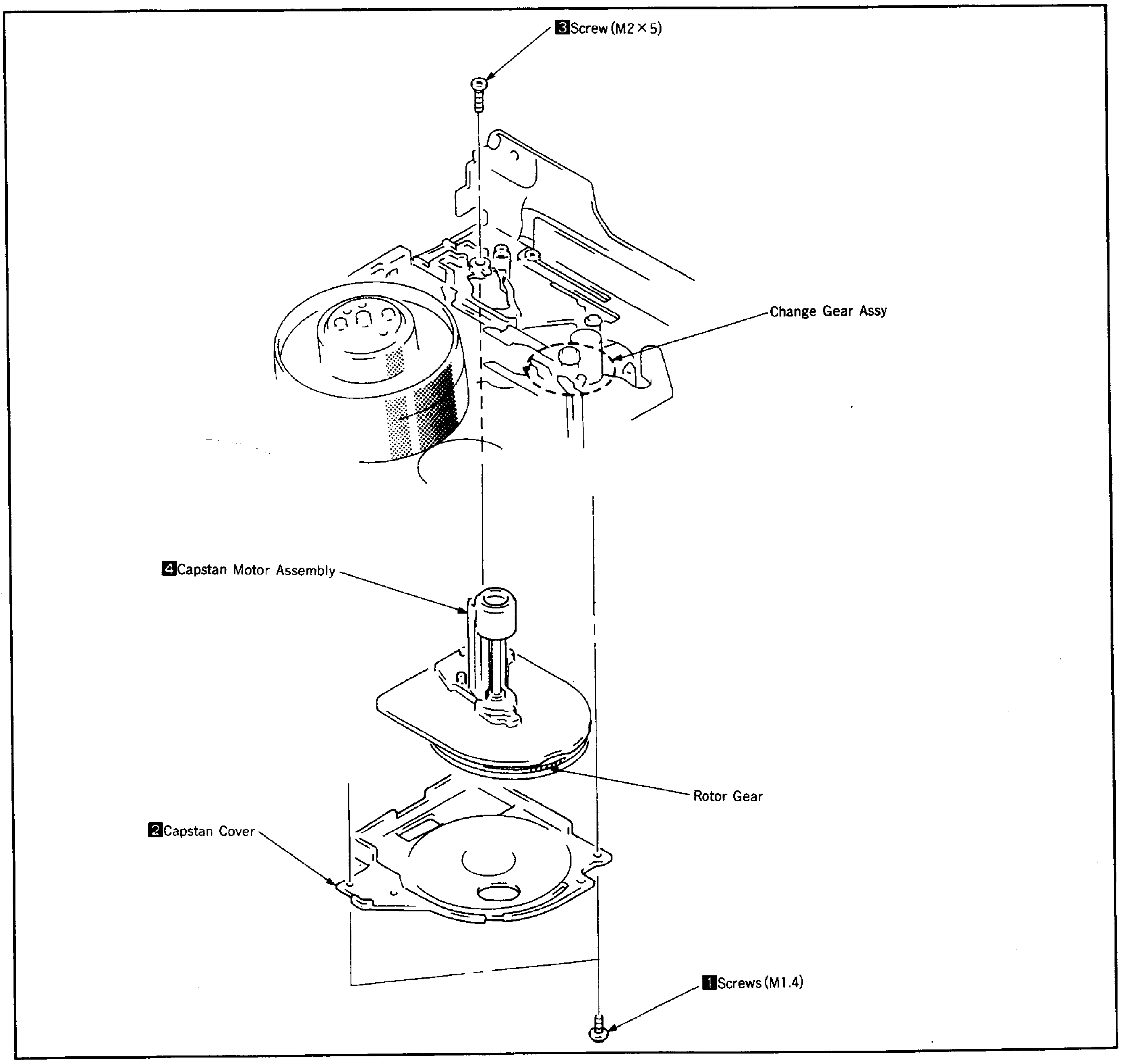

3 Screw (M2 × 5)
Change Gear Assy
4 Capstan Motor Assembly
Rotor Gear
2 Capstan Cover
1 Screws (M1.4)

Fig. 11

3-5. TAKE-UP REEL TABLE ASSEMBLY AND T- SOFT ASSEMBLY (Fig. 12)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Remove the take-up reel table assembly **1**.
4) Remove the T soft assembly **2**, then the T soft arm **3**.

2. Mounting

1) Mount the T soft arm **3** with its long hole ⓒ engaged with the boss ⓓ of LS chassis.
2) Mount the T soft assembly **2** with its tab ⓐ engaged with a square hole ⓑ of T soft arm, as shown in Fig. a.
3) Mount the take-up reel table assembly **1** and rotate it toward the arrow Ⓐ to be latched with T hard claw.
4) Referring to 3-1. mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

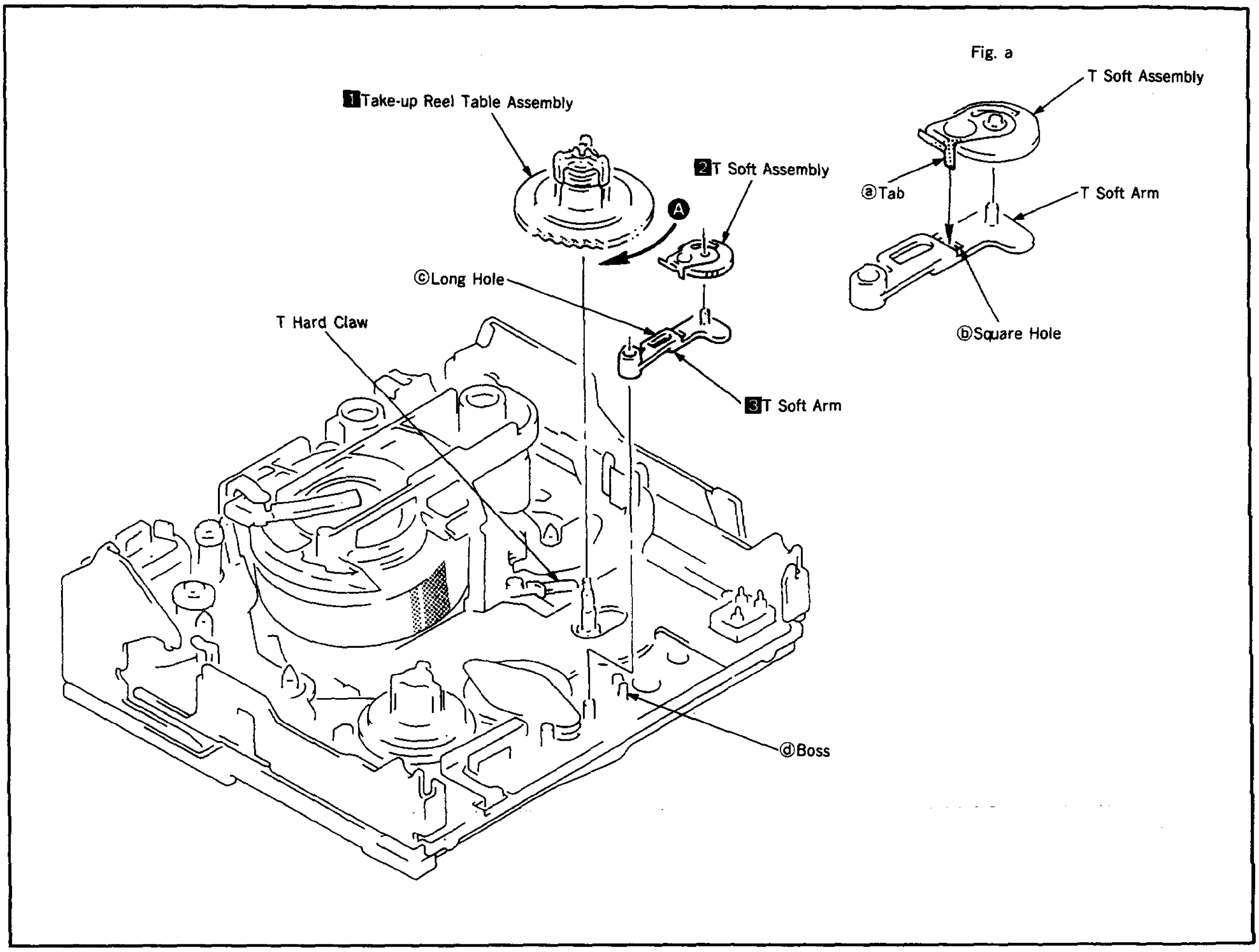


Fig. a
T Soft Assembly
ⓐTab
T Soft Arm
ⓑSquare Hole
1 Take-up Reel Table Assembly
2 T Soft Assembly
Ⓐ
ⓒLong Hole
T Hard Claw
3 T Soft Arm
ⓓBoss

Fig. 12

3-6. PINCH ARM ASSEMBLY (Fig. 13)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Select the READY mode.
3) Remove a washer ❶, then the pinch arm assembly ❷.

2. Mounting

1) Select the READY mode.
2) Hooking a spring of pinch arm assembly ❷ to the cassette positioning boss on the chassis, mount the pinch arm assembly on the shaft of LS chassis assembly as shown in Fig. a.
3) Push in the spring with tweezers up to the root of boss as shown in Fig. b.
4) Mount the washer ❶.
5) Referring to 1-1, mount the cassette compartment assembly.

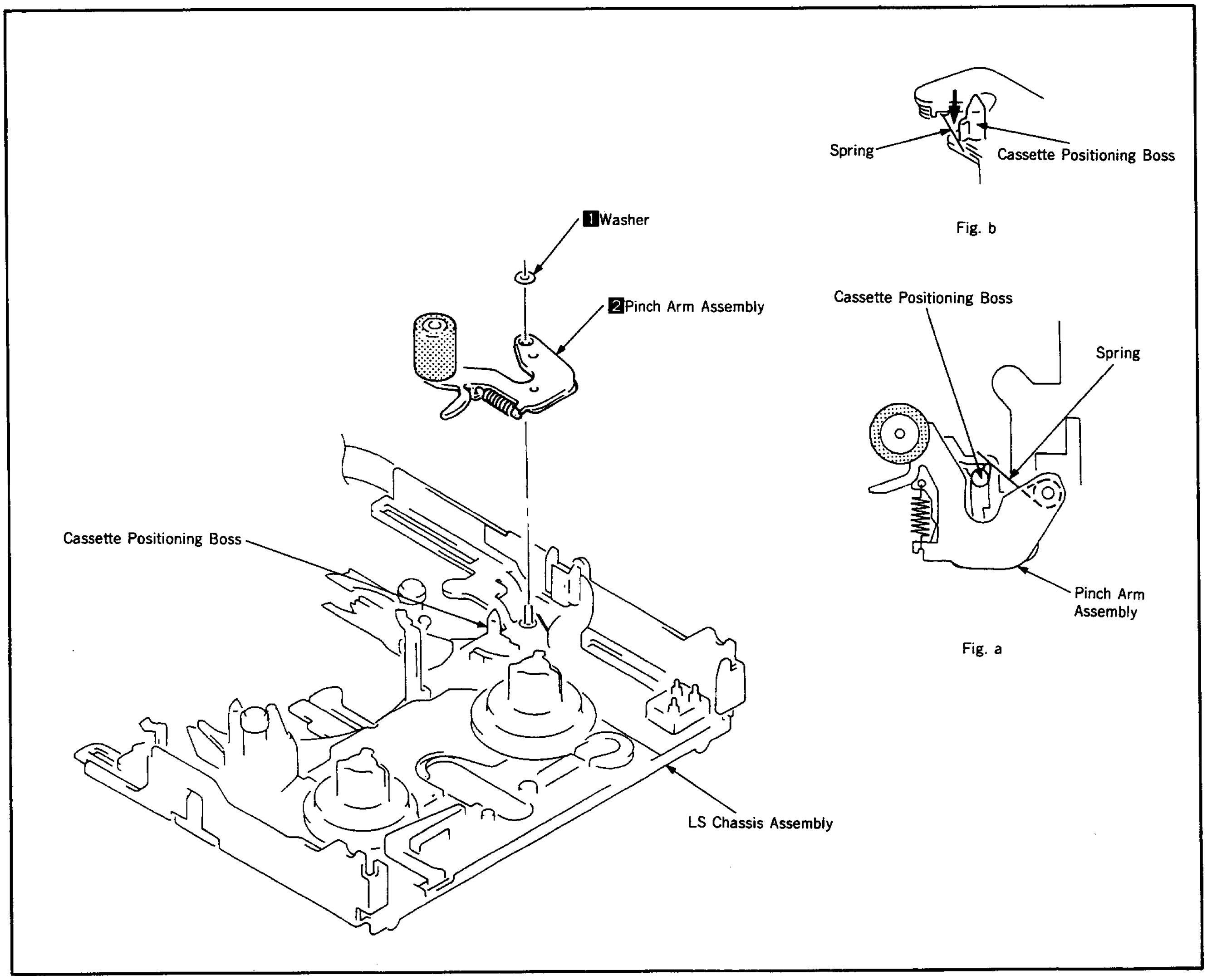

❶Washer
❷Pinch Arm Assembly
Cassette Positioning Boss
LS Chassis Assembly
Spring
Cassette Positioning Boss
Cassette Positioning Boss
Spring
Pinch Arm Assembly

Fig. b

Fig. a

Fig. 13

3-7. LS CHASSIS ASSEMBLY (Fig. 14)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Remove a screw 1, TG-5 base holder 2, and LS flexible board 3.
5) Remove a lock washer 4, then the gooseneck as sembly 5.
6) Remove four screws 6, then the LS chassis assembly 7.

2. Mounting

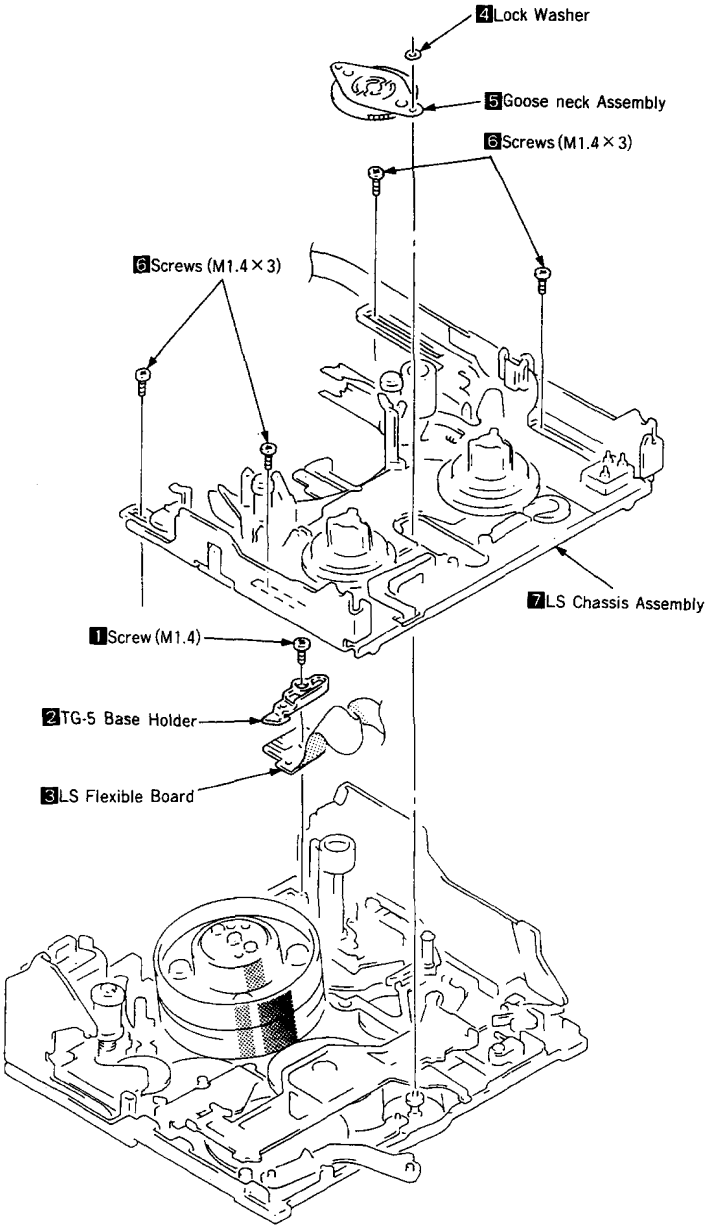
1) Select the USE mode.
2) Confirm that the T hard claw and the outsert on the back of LS chassis are positioned as shown in Fig. a. (The T hard claw must be higher than corner ⓐ of chassis hole.) If not high, turn the outsert in the arrow direction while pushing the T hard claw from LS chassis to the chassis.
3) Sliding the GL slider, align the top edge of long hole ⓑ in GL slider with the edge face ⓒ of LS chassis hole as shown in Fig. b.
4) Mount the LS chassis assembly 7 on the chassis.

Note : At this time, aligh a dowel ⓓ on LS chassis with a long hole ⓔ of No.7 guide on chassis, a long hole of GL slider with a GL arm pin, a groove of LS cam plate with an LS arm pin respectively as shown in Fig. c and d.

5) Tighten four screws 6.
6) Mount the LS flexible board 3 and TG-5 base holder 2,then tighten the screw 1.
7) Mount the Gooseneck assembly 5 and fix it with a washer 4.

Note : Using the mode selector, confirm that loading and unloading are performed smoothly.

8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.
10) Referring to 1-1, mount the cassette compartment assembly.


4 Lock Washer
5 Goose neck Assembly
6 Screws (M1.4 × 3)
6 Screws (M1.4 × 3)
7 LS Chassis Assembly
1 Screw (M1.4)
2 TG-5 Base Holder
3 LS Flexible Board

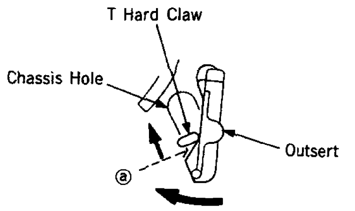

T Hard Claw
Chassis Hole
Outsert
ⓐ

Fig. a

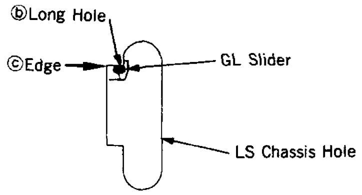

ⓑLong Hole
ⓒEdge
GL Slider
LS Chassis Hole

Fig. b

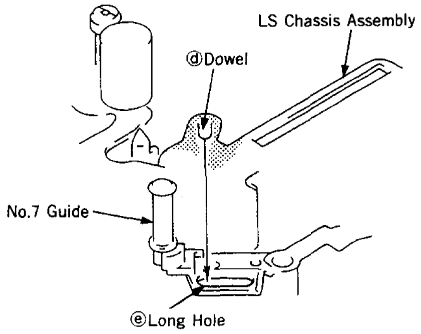

LS Chassis Assembly
ⓓDowel
No.7 Guide
ⓔLong Hole

Fig. c

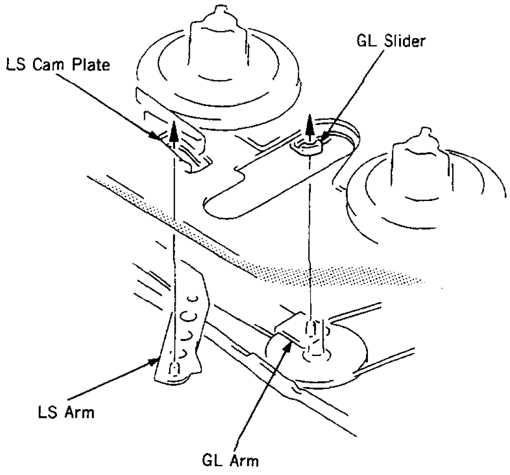

LS Cam Plate
GL Slider
LS Arm
GL Arm

Fig. d

Fig. 14

3-8. GUIDE BASE T ASSEMBLY AND GUIDE BASE S ASSEMBLY (Fig. 15, 16)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Push in the GL slider ❶ toward the arrow Ⓐ, and remove the guide base T assembly ❷ and guide base S assembly ❸ from the guide rail respectively as shown in Fig. 15.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T sofr assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

6) Turning the guide base T assembly ❷ and guide base S assembly ❸ respectively, align the shaft to hole to remove as shown in Fig. a.

2. Mounting

1) Turning the guide base T assembly ❷ and guide base S assembly ❸ respectively, align the shaft with a hole to mount as shown in Fig. a (Fig. 15).
2) On the back side of chassis, insert the guide arm T assembly ❹, guide arm S assembly ❺ and GL slider ❶ from position shown in Fig.b to position shown in Fig. c. Also, aligning the guide base T assembly ❷ and guide base S assembly ❸ with the respective guide rails, push in the GL slider ❶ toward the arrow Ⓑ as shown in Fig. 16.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm.

6) Referring to 1-1, mount the cassette compartment assembly.

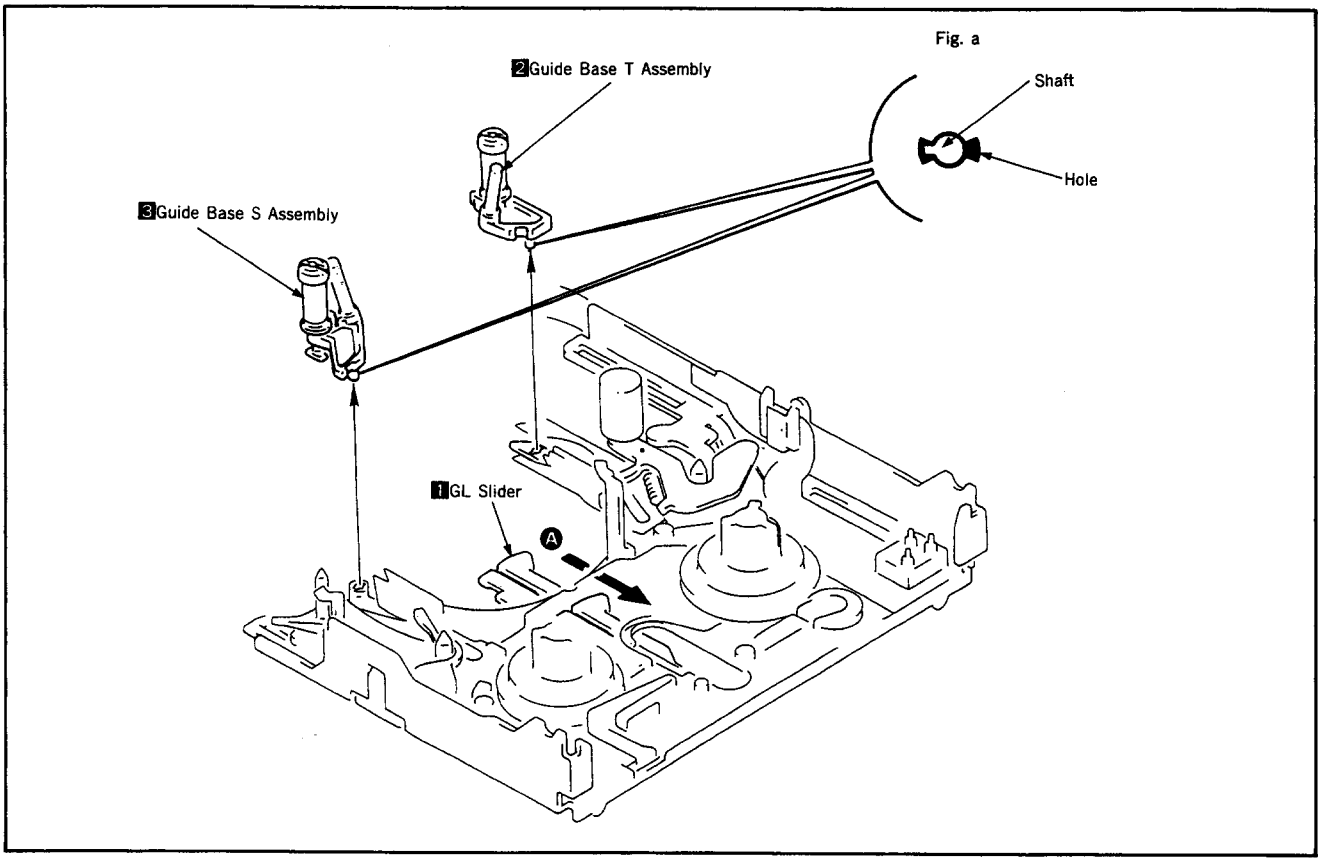


Fig. a
2 Guide Base T Assembly
Shaft
Hole
3 Guide Base S Assembly
1 GL Slider
A

Fig. 15

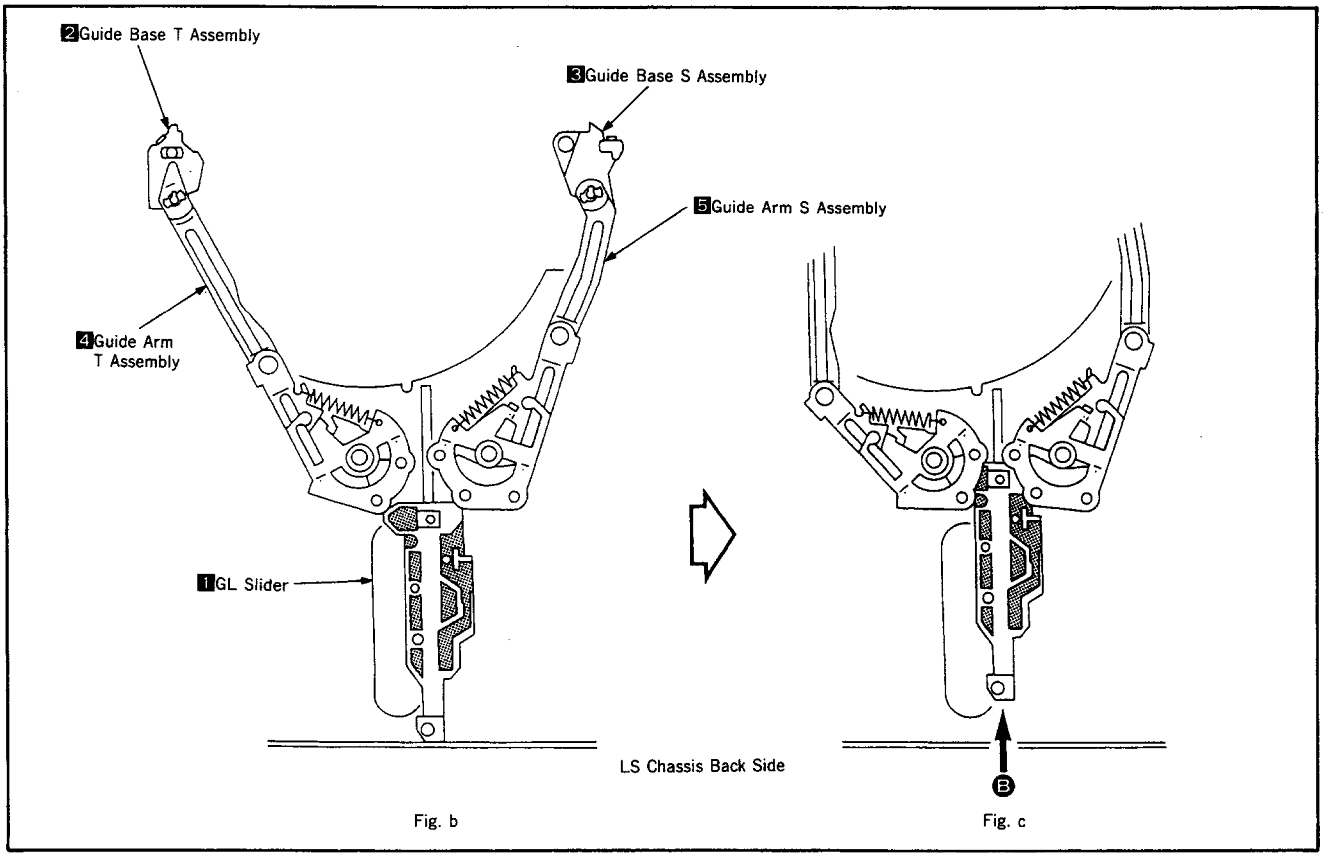

2 Guide Base T Assembly
3 Guide Base S Assembly
5 Guide Arm S Assembly
4 Guide Arm T Assembly
1 GL Slider
LS Chassis Back Side
B

Fig. b

Fig. c

Fig. 16

3-9. GUIDE ARM T ASSEMBLY AND GUIDE ARM S ASSEMBLY (Fig. 17)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base T assembly and guide base S assembly.
6) Remove lock washers ❶, then the guide arm T assembly ❷ and guide arm S assembly ❸ respectively from the back side of chassis.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assmbly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2. Mounting

1) Mount the guide arm T assembly ❷ and guide arm S assembly ❸, then fix them with a lock washer ❶ respectively.

Note : Do not invert the LS chassis up side down, otherwise the T reel table assembly, T soft arm and T soft assembly will drop. Also, take care not to allow the S reel table to float up, or the tension regulator string bends. (Refer to 3-5 T Reel Table Assembly and T Soft Assembly, and 3-10 S Reel Table Assembly and TG-1 Arm Assembly.)

2) Referring to 3-8, mount the guide base T assembly, guide-base S assembly and GL slider.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

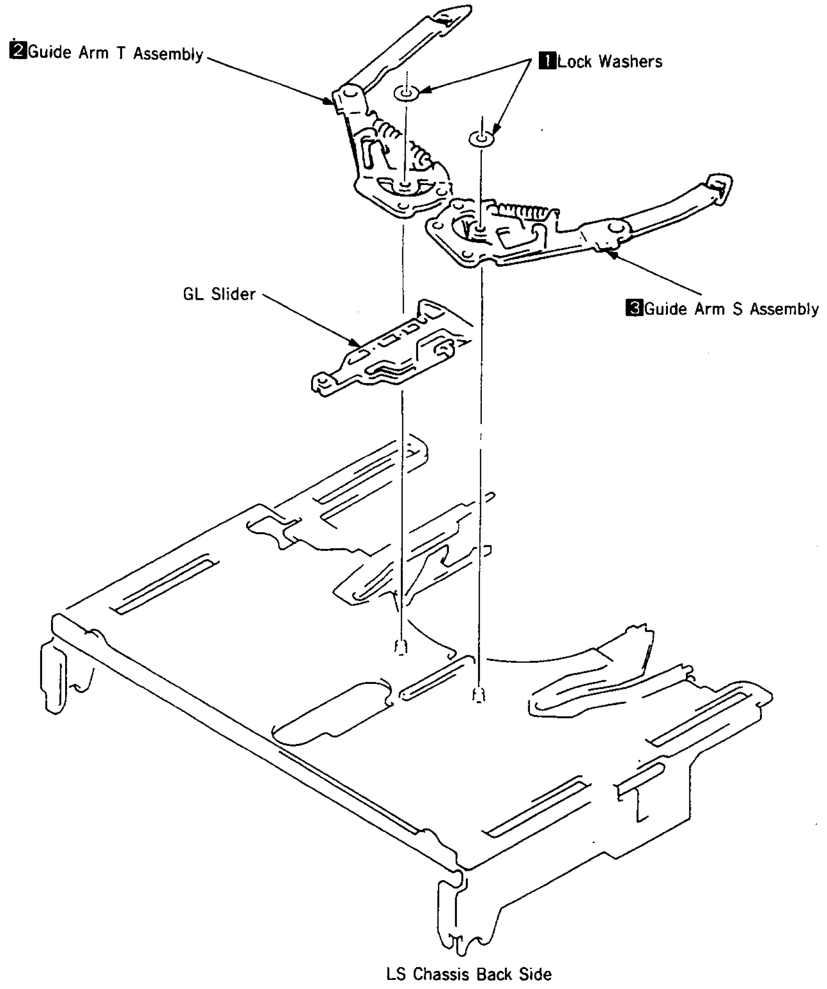


Fig. 17

3-10. SUPPLY REEL TABLE ASSEMBLY AND TG-1 ARM ASSEMBLY (Fig. 18)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-8, remove the guide base S assembly.
6) Remove a screw ❶, then the string ❷ from the supply reel table assembly ❸. For easy removal of string block ❹, insert a flat-blade screwdriver into a groove ⓐ and push it up (Fig. a).
7) Remove the supply reel table assembly ❸.
8) Remove a tension coil spring ❺.
9) Turn the TG-1 arm assembly ❻ up to a portion ⓒ of LS chassis hole in the arrow 🅐 direction so that its tab ⓑ can be disengaged (Fig. b).

2. Mounting

1) Pushing the S soft brake ❼ toward the arrow 🅑, mount thesupply reel table assembly ❸.
2) Route the string ❷ under the TG-1 arm asembly ❻, andinsert the tab ⓑ of TG-1 arm assembly into the LS chassis hole ⓒ, then turn the TG-1 arm assembly in the reverse direction of arow 🅐 (Fig. b).
3) Wind the string ❷ along the groove of supply reel table assembly ❸ (Fig. a).

Note : Do not curl the string extremely. Also, avoid adhesion of oil, otherwise the image will be distorted.

4) Using the FWD B.T. adjusting driver (Ref. No. J-15), shift the string block ❹ toward the arrow 🅒 and tighten the screw ❶ (Fig. a).
5) Engage the tension coil spring ❺ to the chassis hook.

Note : Confirm that the string ❷ is surely wound around the groove of supply reel table assembly ❸ (Fig.a).

6) Referring to 3-8, mount the guide base S assembly.
7) Referring to 3-7, mount the LS chassis assembly.
8) Referring to 3-2, mount the protector base assembly.
9) Referring to 3-1, mount the Retainer, Gooseneck assembly.

Note : At this time, confirm that the T soft assembly is surely engaged with the T soft arm. (Refer to 3-5 Take-up Reel Table Assembly and Take-up Soft Assembly.)

10) Referring to 1-1, mount the cassette compartment assembly.

Note : Referring to 3-22, adjust the tension regulator position.

Note : Referring to 3-23, adjust the forward back tension.

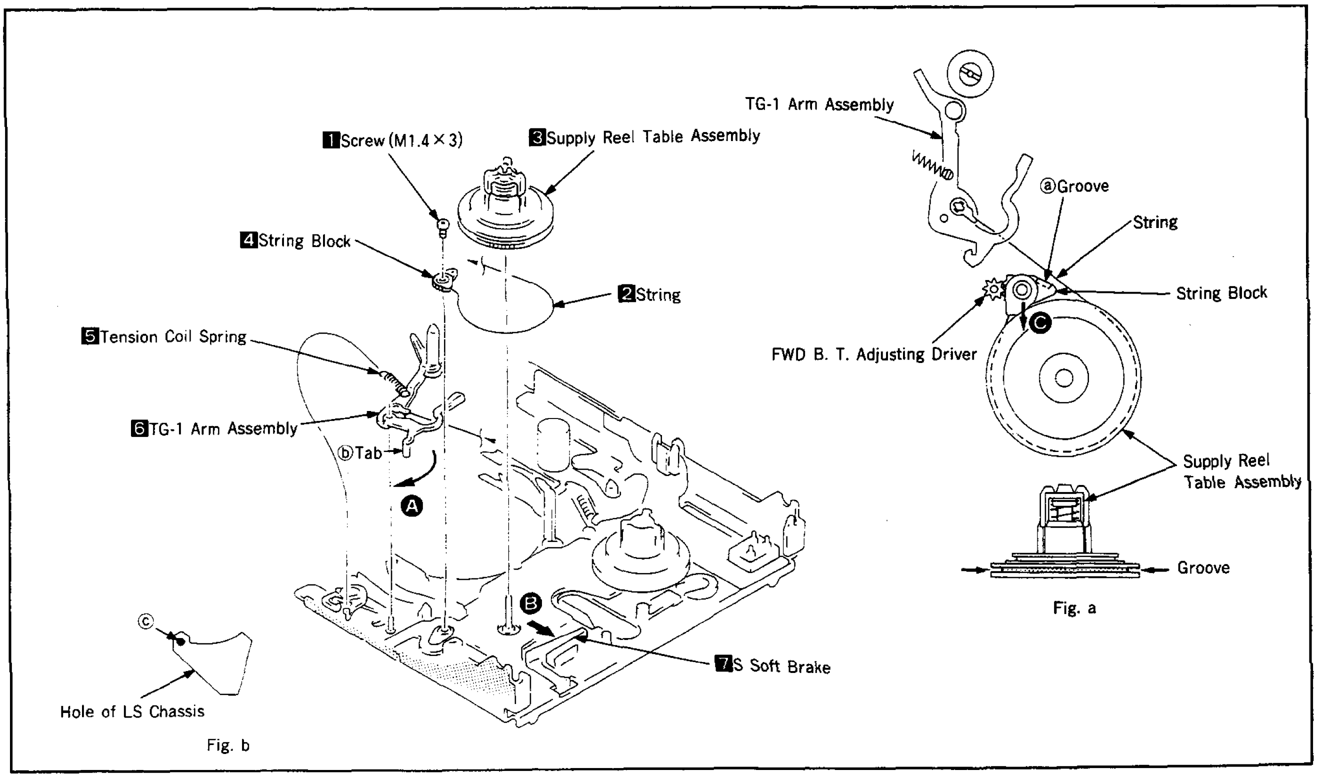

TG-1 Arm Assembly
❶Screw (M1.4 × 3)
❸Supply Reel Table Assembly
ⓐGroove
String
❹String Block
❷String
String Block
❺Tension Coil Spring
FWD B. T. Adjusting Driver
🅒
❻TG-1 Arm Assembly
ⓑTab
🅐
Supply Reel Table Assembly
Groove
🅑
ⓒ
❼S Soft Brake
Hole of LS Chassis

Fig. a

Fig. b

Fig. 18

3-11. TG-2 ROLLER ASSEMBLY (Fig. 19)

1. Removal

1) Remove the TG-2 roller assembly ❶ .
2) Remove a compression coil spring ❷ .

2.Mounting

1) Insert a compression coil spring ❷ into the boss on chassis.
2) Rotate gently the TG-2 roller assembly ❶ until the screw is engaged.

3. Presetting of TG-2 Roller Height (Fig. a)

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3. 3 ± 0. 05mm.

Note : After adjustment, perform 4. TAPE PATH ADJUSTMENT.

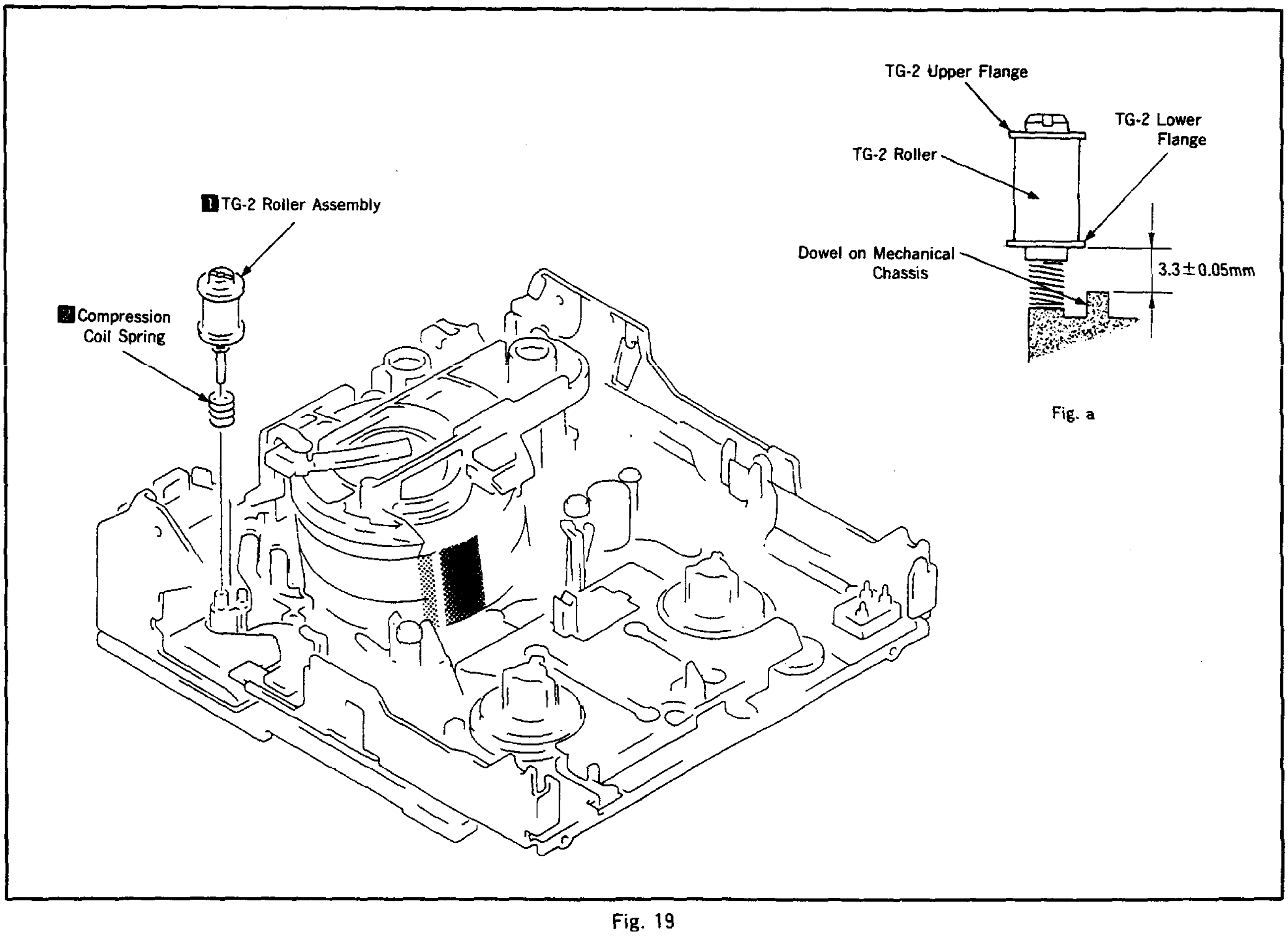

❶TG-2 Roller Assembly
❷Compression Coil Spring
TG-2 Upper Flange
TG-2 Lower Flange
TG-2 Roller
Dowel on Mechanical Chassis
3.3±0.05mm

Fig. a

Fig. 19

3-12. TG-7 ARM ASSEMBLY (Fig. 20)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Raise a portion ⓐ of TG-7 arm Leaf spring ❶ in arrow direction with a flat-blade screwdriver or tweezers to disengage the tab from the chassis, then remove the TG-7 arm Leaf spring as shown in Fig. a.
6) Remove the TG-7 assembly ❷ from the shaft of mechanical-chassis.

2. Mounting

1) Mount the TG-7 arm assembly ❷ to the shaft of mechanical-chassis.
2) Mount the TG-7 arm Leaf spring ❶ to the mechanicalchassis.
   ***Push in the tab of Leaf spring until it clicks into a detent ofchassis (Fig. a).**
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartmnet assembly.

Note : After mounting, perform 4. TAPE PATH ADJUSTMENT.

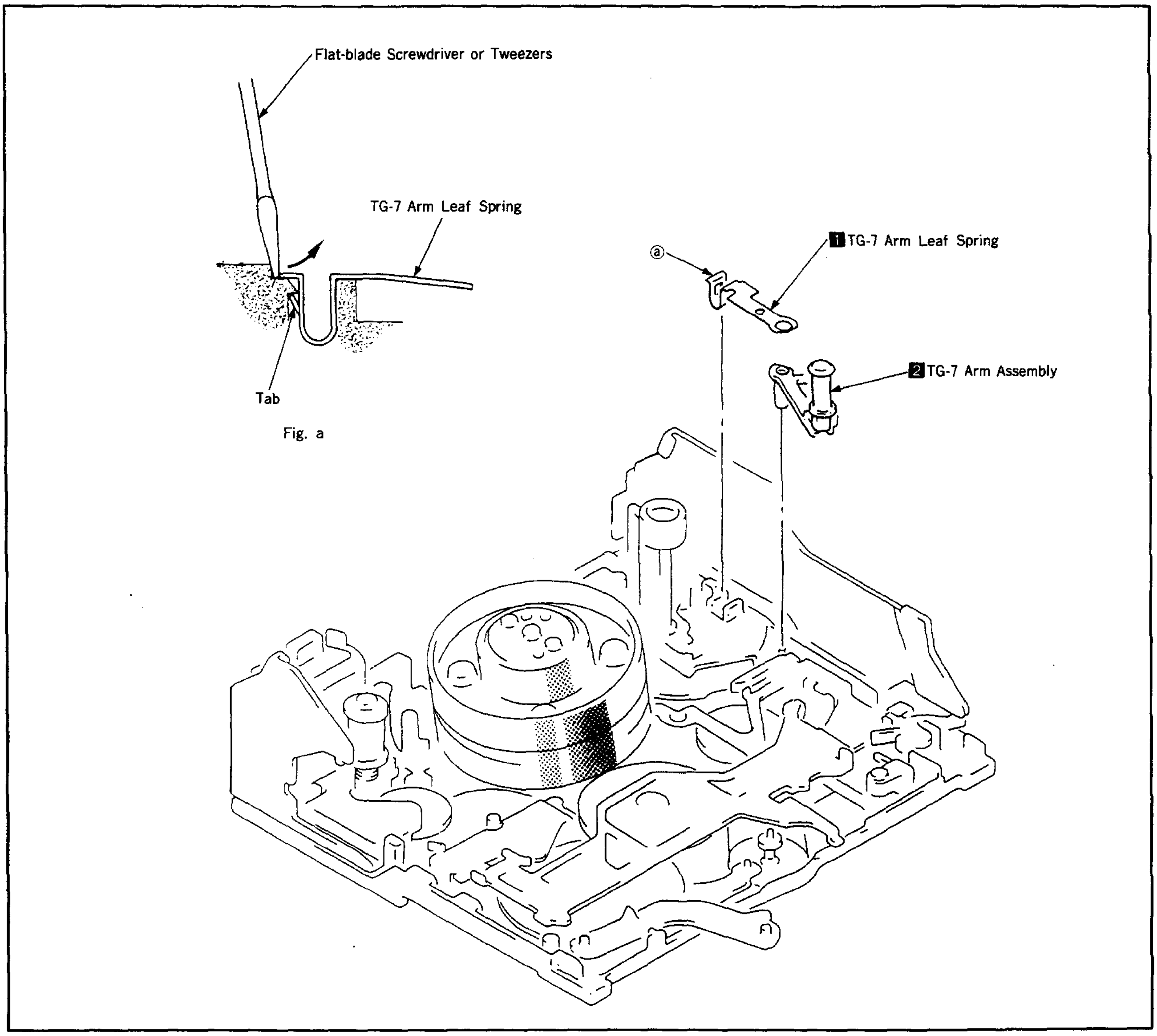


Fig. 20

3-13. LM MOTOR ASSEMBLY (Fig. 21)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Select the LOAD mode (at the position where the FF arm assembly is not above the screw ❶).
6) Remove two screws ❶, then the LM motor assembly ❷.

2. Mounting

1) Aligning the dowel ⓐ of LM motor assembly ❷ with the hole ⓑ of mechanical chassis, mount the LM motor assembly with its hole Ⓒ inserted into the mechanical chassis shaft ⓓ.
2) Tighten two screws ❶.
3) Referring to 3-7, mount the LS chassis assembly.
4) Referring to 3-2, mount the protector base assembly.
5) Referring to 3-1, mount the Retainer, Gooseneck assembly.
6) Referring to 1-1, mount the cassette compartment assembly.

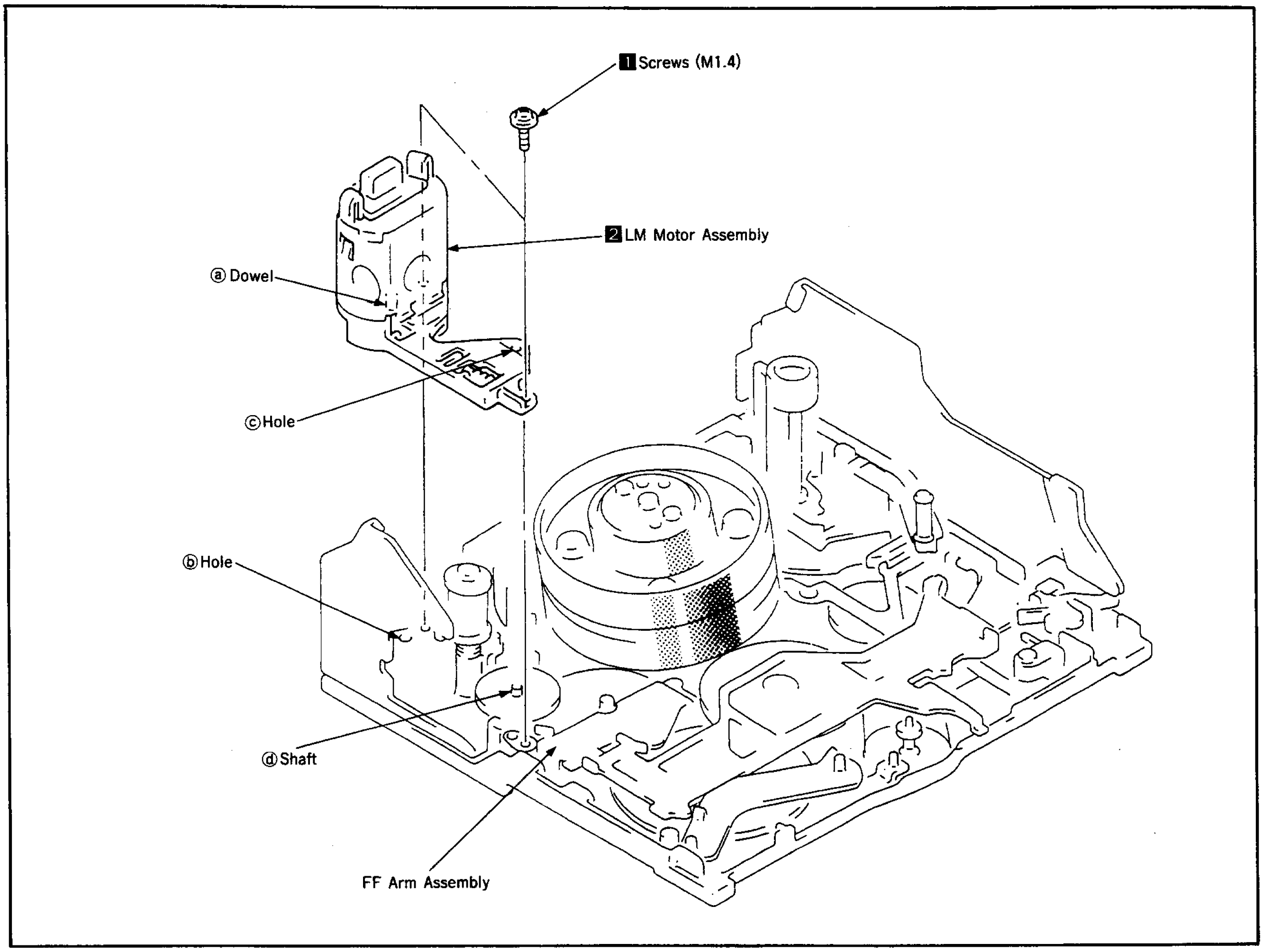


Fig. 21

3-14. LS ARM (Fig. 22)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the proctector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove the LS arm ❶ from the shaft of mechanical chassis.

Note : Take care not to drop the LS roller ❷.

2. Mounting

1) Mount the LS arm ❶ meeting with mechanical chassis shaft and cam groove.

Note : Move the LS arm ❶ in arrow direction to confirm that the LS roller ❷ is surely inserted.

2) Referring to 3-7, mount the LS chassis assembly.
3) Referring to 3-2, mount the protector base assembly.
4) Referring to 3-1, mount the Retainer, Gooseneck assembly.
5) Referring to 1-1, mount the cassette compartment assembly.

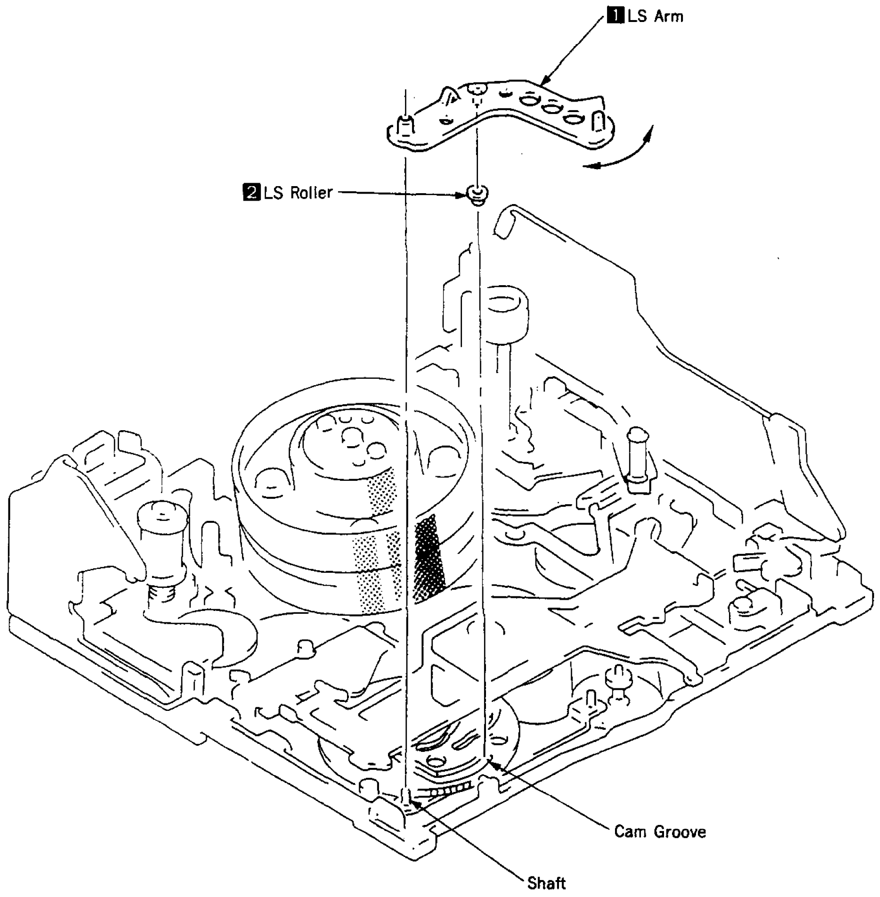


Fig. 22

3-15. M SLIDER ASSEMBLY (Fig. 23)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Remove two screws ❶, then the gear holder ❷.
6) Remove two lock washers ❸, then the M slider assembly ❹.

2. Mounting

1) Mount the M slider assembly ❹, aligning long holes ⓐ and ⓑ of M slider assembly with shafts ⓒ and ⓓ of mechanical chassis, and a long hole ⓔ with shaft ⓕ of press arm assembly, and also shaft ⓖ with outer groove ⓗ of cam respectively.
2) Mount two lock washers ❸.
3) Mount the gear holder ❷ with its outserts ⓘ and ⓙ inserted into holes in the mechanical chassis.
4) Tighten two screws ❶.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

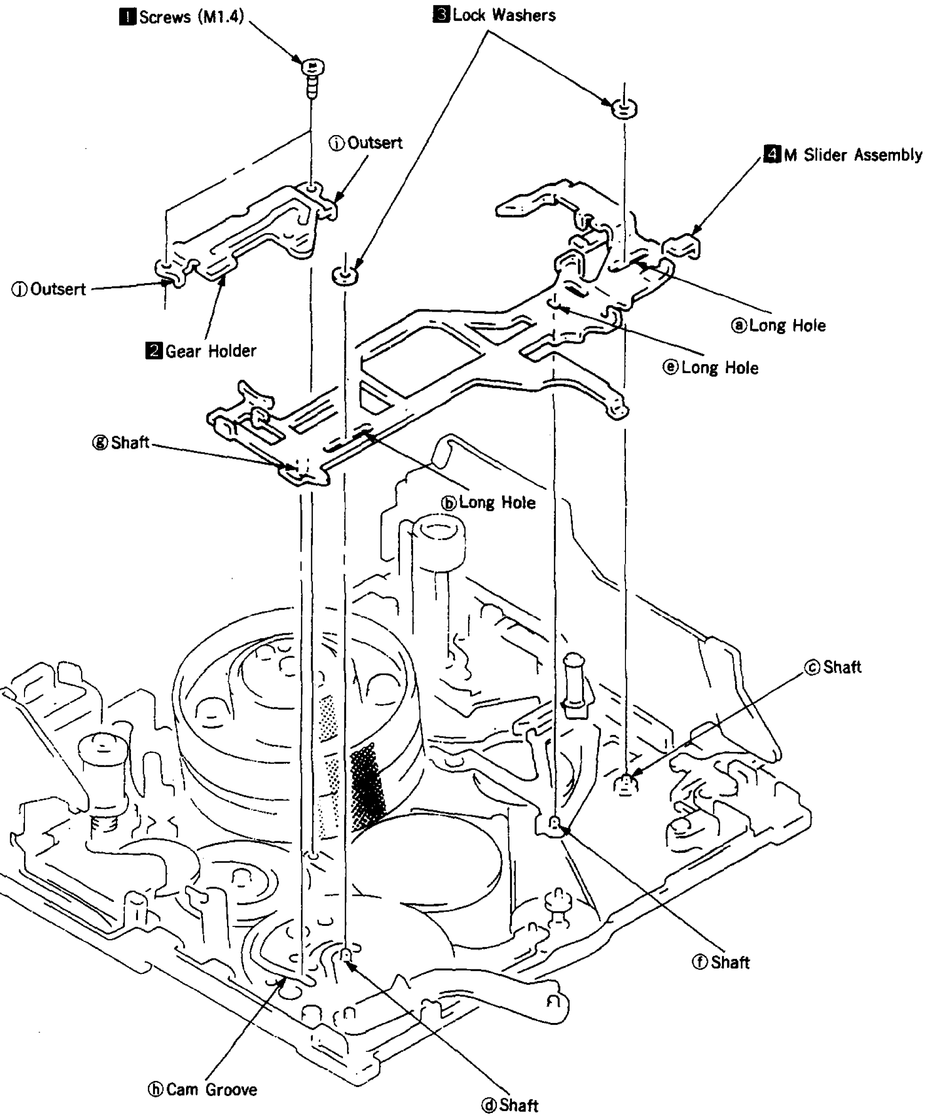

❶ Screws (M1.4)
❸ Lock Washers
ⓘ Outsert
❹ M Slider Assembly
ⓙ Outsert
ⓐ Long Hole
❷ Gear Holder
ⓔ Long Hole
ⓖ Shaft
ⓑ Long Hole
ⓒ Shaft
ⓕ Shaft
ⓗ Cam Groove
ⓓ Shaft

Fig. 23

3-16. PINCH PRESS ARM ASSEMBLY (Fig. 24)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assemvly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove a lock washer ❶, then pinch press arm assembly ❷.

2.Mounting

1) Mount the pinch press arm assembly ❷, inserting its shaft ⓐ into the cam groove ⓑ of HC drive arm, and hole ⓒ into the shaft ⓓ of mechanical chassis.
2) Mount the lock washer ❶.
3) After mounting, shift the pinch press arm assembly toward the arrow direction.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-3, mount the drum assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

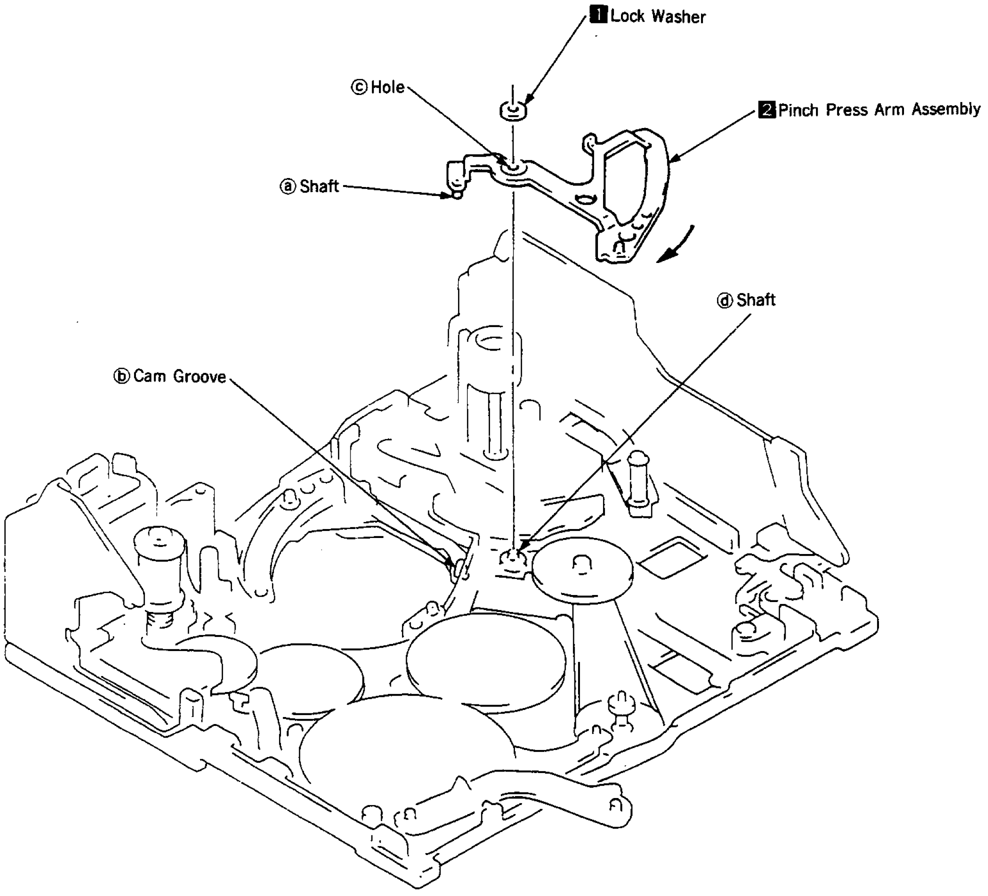


Fig. 24

3-17. CAM (Fig. 25)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Remove the cam ❶.

2. Mounting

1) Referring to 3-13, remove the LM motor assembly.

Note : Take care not to allow grease of LM motor assembly to stick to the TG-2 roller assembly.

2) Mount the cam ❶, aligning its center hole with shaft of mechanical chassis, and the cam groove with the shaft of GL arm assembly. At this time , make sure that the ▲ mark on L gear B is aligned with that on the cam and also a recess is aligned with the phase aligning hole respectively as shown in Fig. a.

Note : Apply grease to the cam groove if it scarecely remains.

3) Mount the LM motor assembly.
4) Referring to 3-15, mount the M slider assembly.
5) Referring to 3-14, mount the LS arm assembly.
6) Referring to 3-7, mount the LS chassis assembly.
7) Referring to 3-2, mount the protector base assembly.
8) Referring to 3-1, mount the Retainer, Gooseneck assembly.
9) Referring to 1-1, mount the cassette compartment assembly.

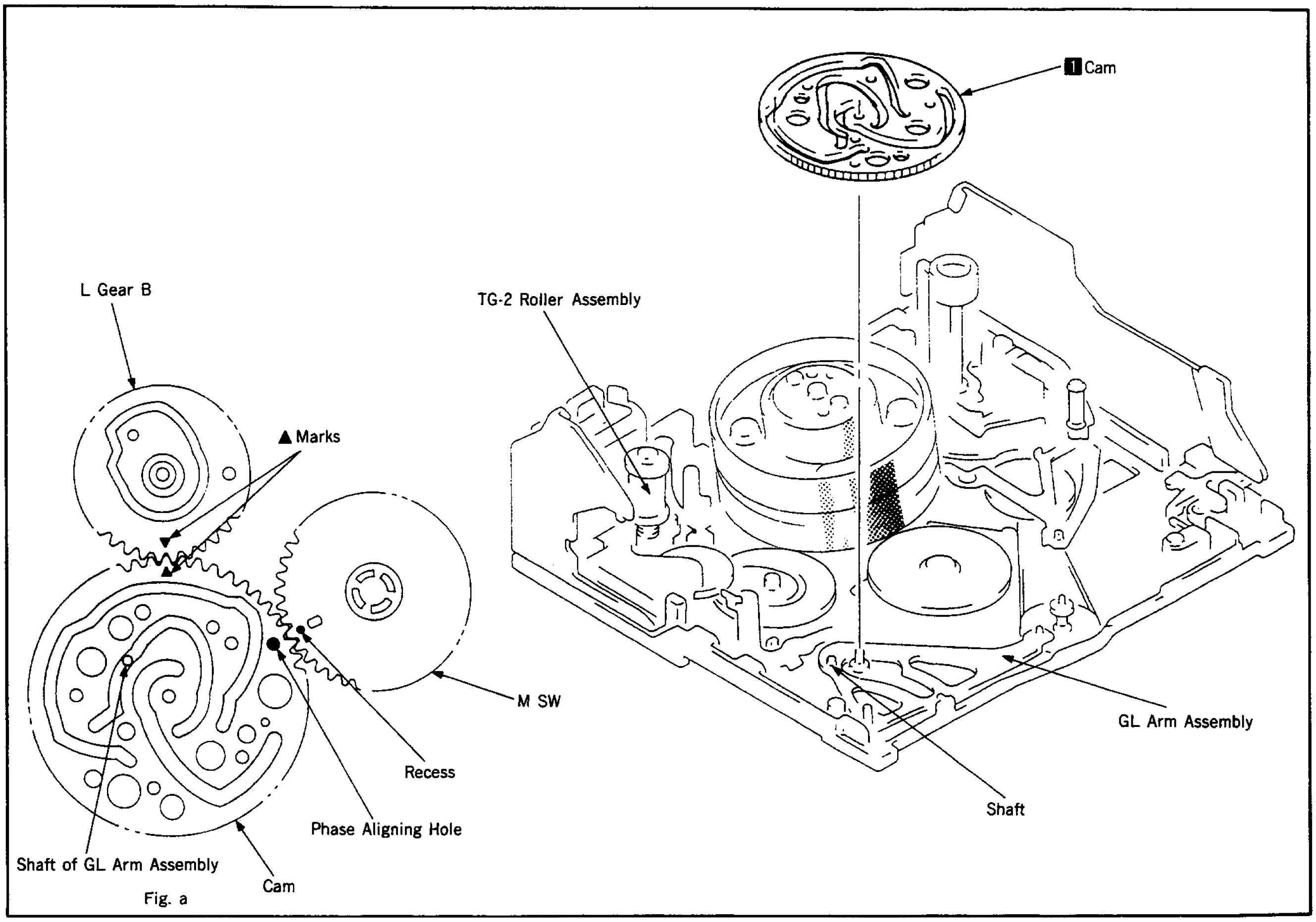


Fig. a

Fig. 25

3-18. GL ARM ASSEMBLY (Fig. 26)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Remove the GL arm assembly ❶.

2. Mounting

1) Mount the GL arm assembly ❶ with its hole ⓐ inserted into the shaft ⓑ of mechanical chassis.
2) Referring to 3-17, mount the cam.
3) Referring to 3-15, mount the M slider assembly.
4) Referring to 3-14, mount the LS arm assembly.
5) Referring to 3-7, mount the LS chassis assembly.
6) Referring to 3-2, mount the protector base assembly.
7) Referring to 3-1, mount the Retainer, Gooseneck assembly.
8) Referring to 1-1, mount the cassette compartment assembly.

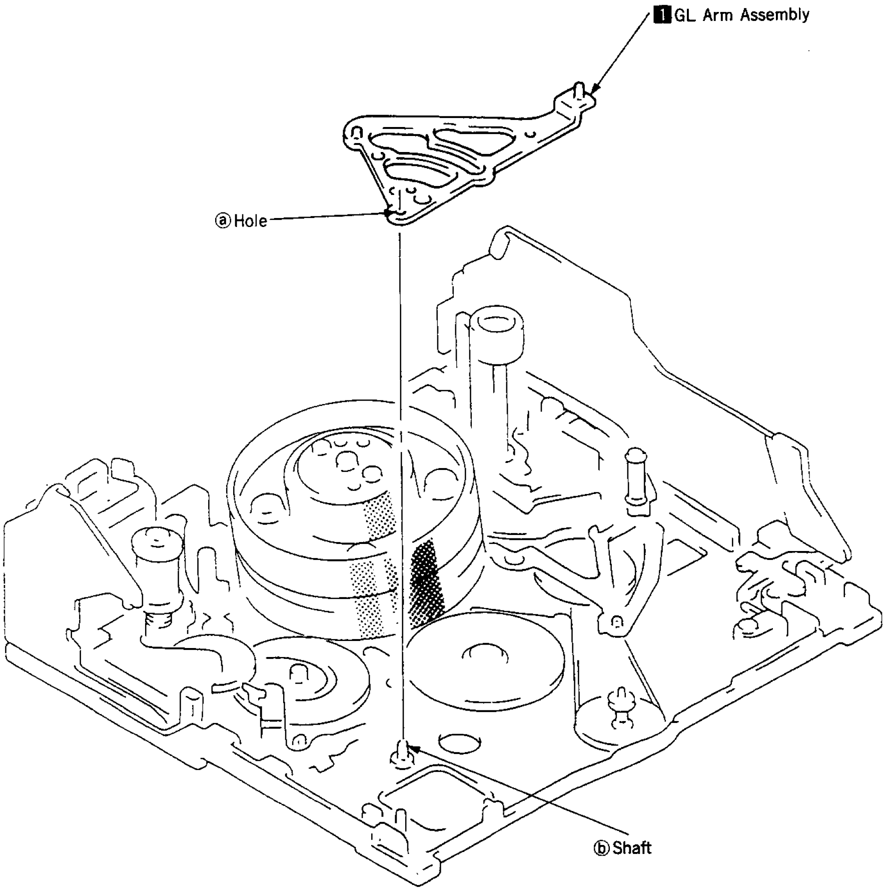


Fig. 26

3-19. L GEAR A AND L GEAR B (Fig. 27)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-7, remove the LS chassis assembly.
5) Referring to 3-14, remove the LS arm assembly.
6) Referring to 3-15, remove the M slider assembly.
7) Referring to 3-17, remove the cam.
8) Referring to 3-13, remove the LM motor assembly.
9) Remove the FF arm assembly ❶.
10) Remove the L gear A ❷.
11) Remove the L gear B ❸.

2. Mounting

1) Insert the L gear B ❸ into the shaft of mechanical chassis. (At this time, the phase aligning mark ▲ should be faced toward the cam mounting shaft ⓐ.)
2) Insert the L gear A ❷ into the shaft of mechanical chassis.
3) Mount the FF arm assembly ❶ with its two shafts inserted into the cam groove of L gear B ❸ and the hole of mechanical chassis.
4) Referring to 3-17, mount the cam.
5) Referring to 3-13, mount the LM motor assembly.
6) Referring to 3-15, mount the M sleder assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-2, mount the protector base assembly.
10) Referring to 3-1, mount the Retainer, Gooseneck assembly.
11) Referring to 1-1, mount the cassette compartment assembly.

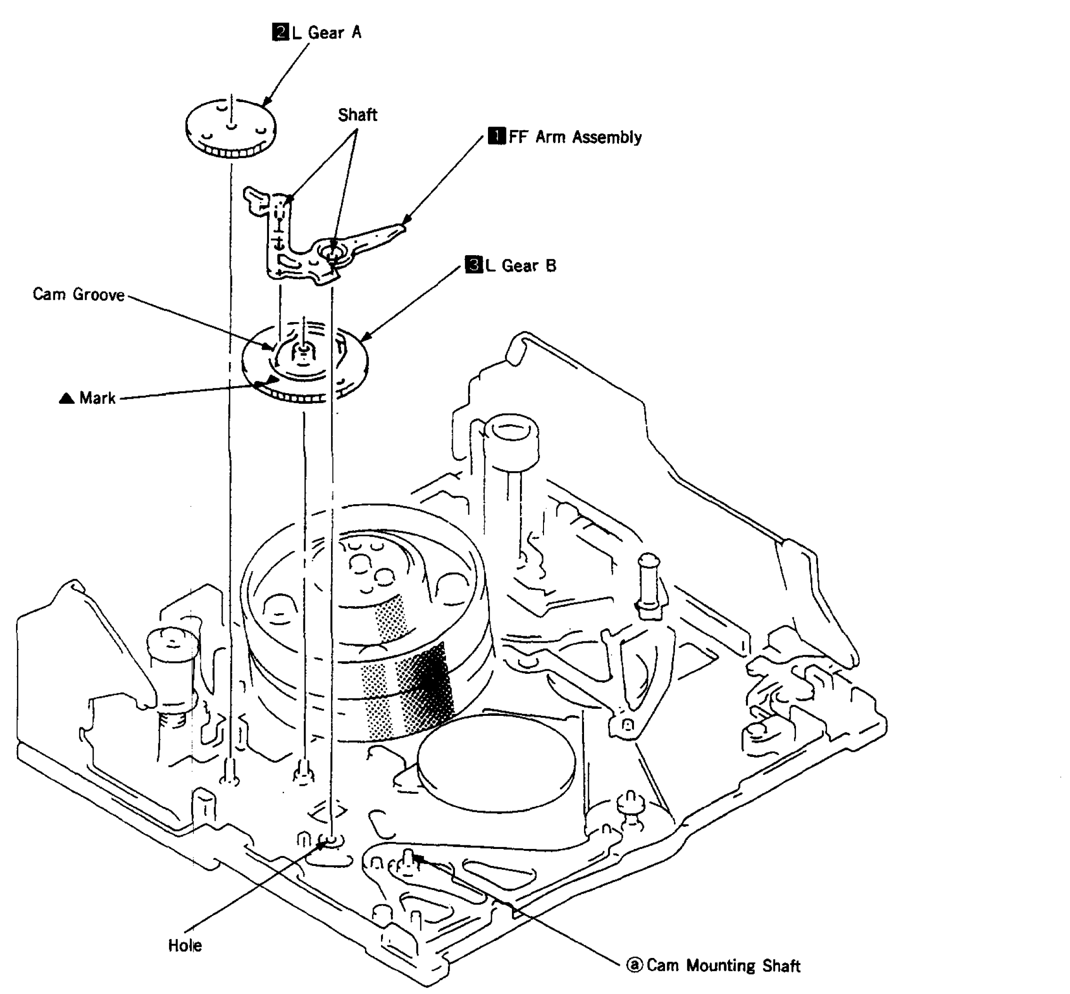


Fig. 27

3-20. RELAY PULLEY AND CHANGE GEAR ASSEMBLY (Fig. 28)

1. Removal

1) Referring to 1-1, remove the cassette compartment assembly.
2) Referring to 3-1, remove the Retainer, Gooseneck assembly.
3) Referring to 3-2, remove the protector base assembly.
4) Referring to 3-3, remove the drum assembly.
5) Referring to 3-7, remove the LS chassis assembly.
6) Referring to 3-14, remove the LS arm assembly.
7) Referring to 3-15, remove the M slider assembly.
8) Referring to 3-17, remove the cam.
9) Referring to 3-18, remove the GL arm assembly.
10) Referring to 3-16, remove the pinch press arm assembly.
11) Remove a lock washer ❶, then remove together the Change gear assembly ❷, relay belt ❸ and relay pulley ❹.

2. Mounting

*Give one or two drips of oil to the conversion gear shaft and relay pulley shaft respectively. (Oiling range is under the neck as shown in Fig. a.)

1) Hooking the relay belt ❸ to the relay pulley ❹ and Change gear assembly ❷, mount respective parts.
   *At first, insert the relay pulley into the mechanical chassis-shaft, then the change gear assembly by engaging with the capstan motor gear.

Note : Take care not to damage the Change gear by the capstan motor gear.

2) Mount a lock washer ❶.
3) Referring to 3-16, mount the pinch press arm assembly.
4) Referring to 3-18, mount the GL arm asembly.
5) Referring to 3-17, mount the cam.
6) Referring to 3-15, mount the M slider assembly.
7) Referring to 3-14, mount the LS arm assembly.
8) Referring to 3-7, mount the LS chassis assembly.
9) Referring to 3-3, mount the drum assembly.
10) Referring to 3-2, mount the protector base assembly.
11) Referring to 3-1, mount the Retainer, Gooseneck assembly.
12) Referring to 1-1, mount the cassette compartment assembly.

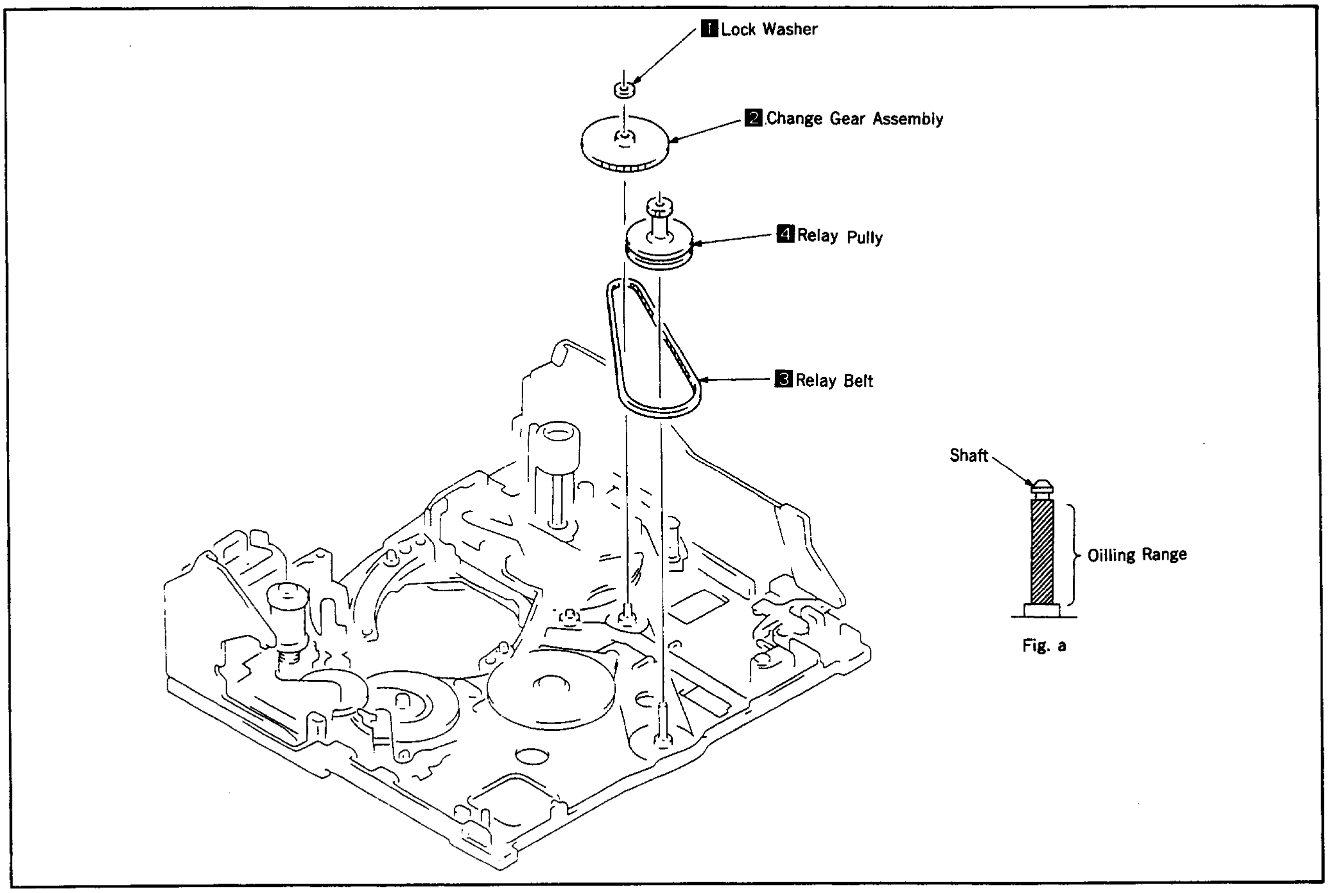


Fig. 28

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removoal

· If possible, make a recording before removal.

1) Remove the two screws 1 (Fig. 29).
2) Mount the jig 2 (Ref. No. J-10) with the two supplied screws 3, then screw the attached hexagon socket screws 4 to the jig 2. The rotary upper drum 5 will move upward and come off (Fig. 30).

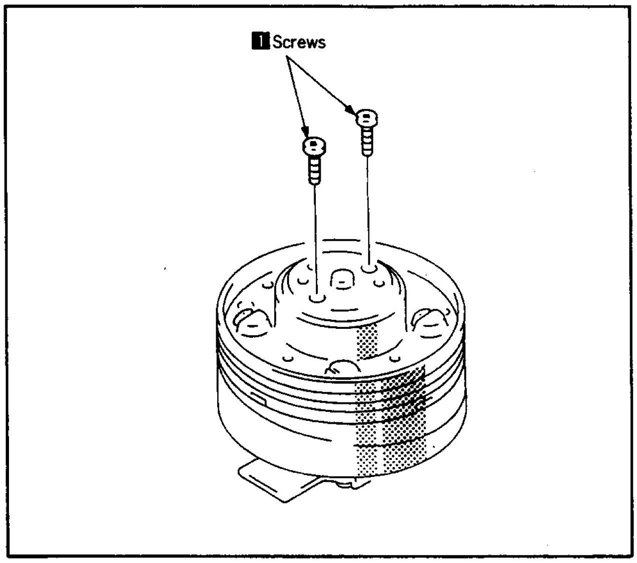


Fig. 29

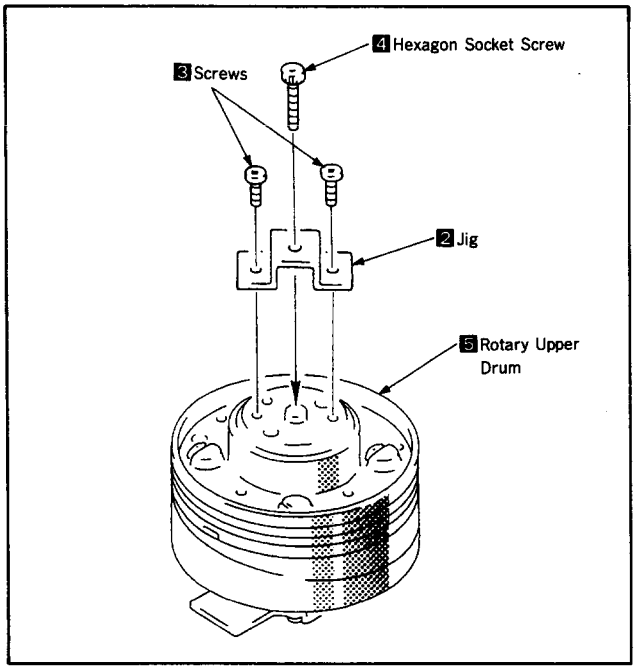


Fig. 30

2. Installation

1) Wipe clean the flange surface and the rotary upper drum 5 surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig 6 (Ref. No. J-10) into the drum positioining hole, then set then set the rotary upper drum 5 by passing the jig through its positioning hole 7. (Fig.31)
3) Remove the jig 6 and push down the rotary upper drum 5 gently by hand. If it does not go all the way down, secure it temporarily by tightening the two screws 1 alternately (Fig.29).
4) Insert the jig 6 into the positioning hole 7 again and confirm that it goes in smoothly. If it does not, loosen the two screws 1, repeat step 2) of the Removal paragraph and restart the setting procedure.
5) Tighten the screws 1.

Note : After installing, be sure to perform tape path adjustment as described in section 4.

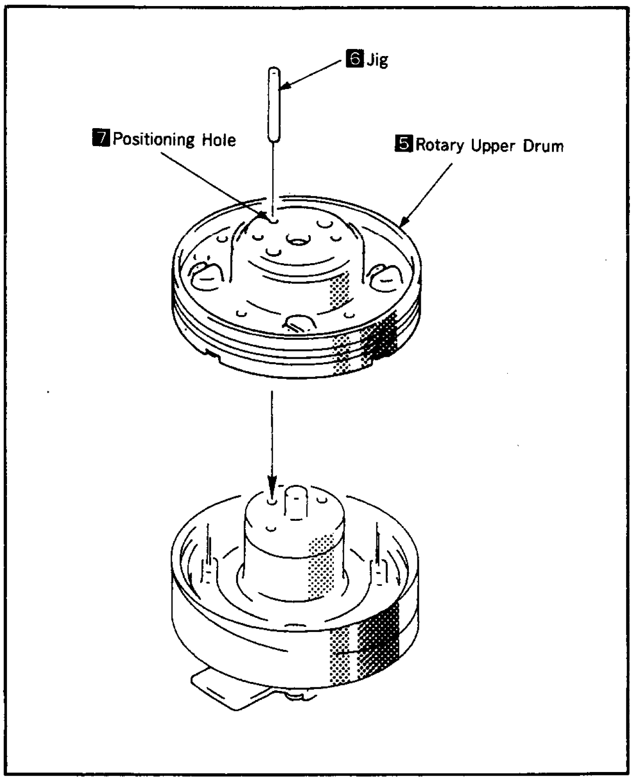


Fig. 31

3-22. ADJUSTMENT OF TENSION REGULATOR POSITION (Fig. 32)

1. Adjustment

1) Set a cassett tape and run the tape in the PB mode.
2) With the tape running, check that the distance from No.1 guide to No. 2 guide upper flange is 4.2 mm.
3) If they are not at the specified positions, perform adjustment in step 4) and subsequent steps.
4) Loosen the screw ❶.
5) If No.1 guide is located inside the specified position, shift the string block toward the arrow Ⓐ using the FWD B.T. adjusting driver (Ref No. J-15). Or, if it is located outside, shift toward the arrow Ⓑ.
6) Tighten the screw ❶.

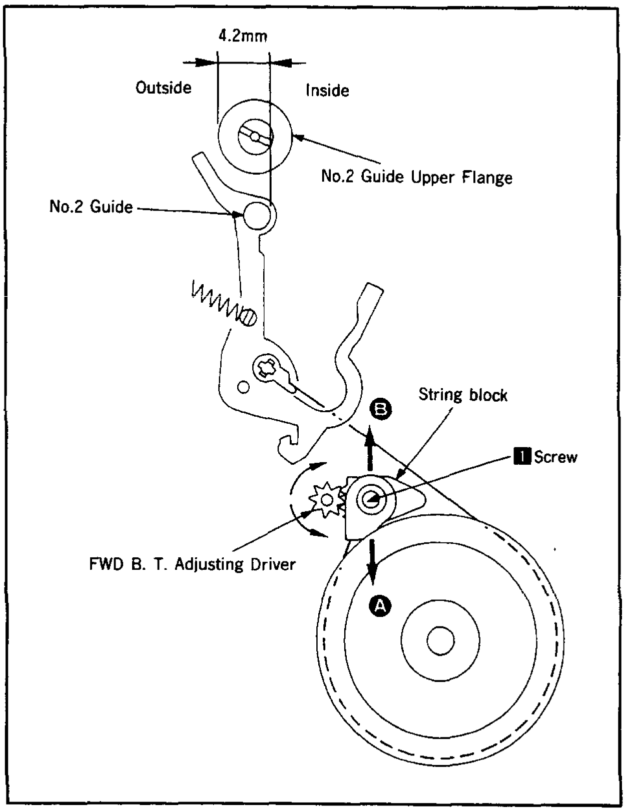

4.2mm
Outside
Inside
No.2 Guide Upper Flange
No.2 Guide
Ⓑ
String block
❶ Screw
FWD B. T. Adjusting Driver
Ⓐ

Fig. 32

3-23. FWD BACK TENSION ADJUSTMENT (Fig.33)

1) Select the TEST mode 1 using the adjusting remote controller (Ref No. J-17).
2) Set the torque cassette (Ref No.J-10).
3) Select the FWD mode, and check that the torque of S reel table is 8.5 ~ 11.5 g · cm.
   If it is out of standard, adjust the TG-1 spring hook position using the FWD B.T. adjusting driver (Ref No. J-15).

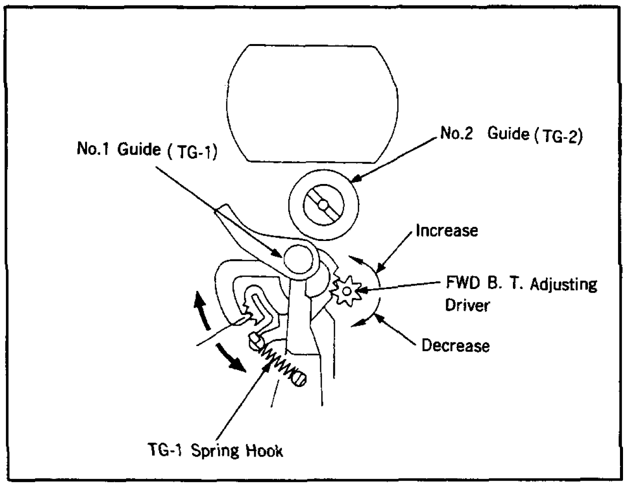

No.1 Guide (TG-1)
No.2 Guide (TG-2)
Increase
FWD B. T. Adjusting Driver
Decrease
TG-1 Spring Hook

Fig. 33

3-24. REEL TORQUE CHECK

1) Set the torque cassette.
2) Select the FWD mode, and check that the torque fluctuation center of T reel table is 7 ~ 17 g · cm
3) Select the REV mode, and check that the torque fluctuation center of S reel table is 25 ~ 39 g · cm.
4) Select the REV mode, and check that the torque of T reel table is 7 ~ 17 g · cm.
5) If the above data is not satisfied, the tension regulator band, T hard tab or T soft assembly will be faulty. Check them first, and if no abnormality is found, replace respective reel tables.

4. TAPE PATH ADJUSTMENT

The 8mm video system uses ATF (Automatic Track Finding) which instantaneously controls a tape running speed based on 4 types of pilot signals and performs high-precision tracking.
This does away a tracking control knob and allows accurate track tracing.
On the other hand, however, the ATF system has a problem in adjusting the tape path system. That is, if head tracing is out of order a little, the ATF automatically corrects it, which means that perfect adjustment cannot be done.
Therefore, in the A mechanism, the ATF system is forcibly operated to shift a tracking amount constantly (approx. 1/4) by setting the PATH mode with the adjusting remote controller (Ref No.J-16). So, fine tracking adjustment can be easily done. Also, the PATH mode setting varies with the model, and therefore, refer to the Service Manual.

Example) For CCD-FX410 series
Set the adjusting remote controller to the HOLD ON side.

1) Set PAGE : 1, ADDRESS : 00, DATA : 01 to cancel the PROTECT mode.
2) Set PAGE : D, ADDRESS : 01, DATA : 03 to select the PATH mode.

Note : Setting of PATH mode = TRACK SHIFT mode
If the adjusting remote controller (Ref No.J-16) is set to HOLD OFF once, then set to HOLD ON again after mode setting, the display of ADDRESS and DATA changes.

3) After adjustment is over, set DATA : 00, and press the PAUSE buttom on the adjusting remote controller (Ref No. J-16).

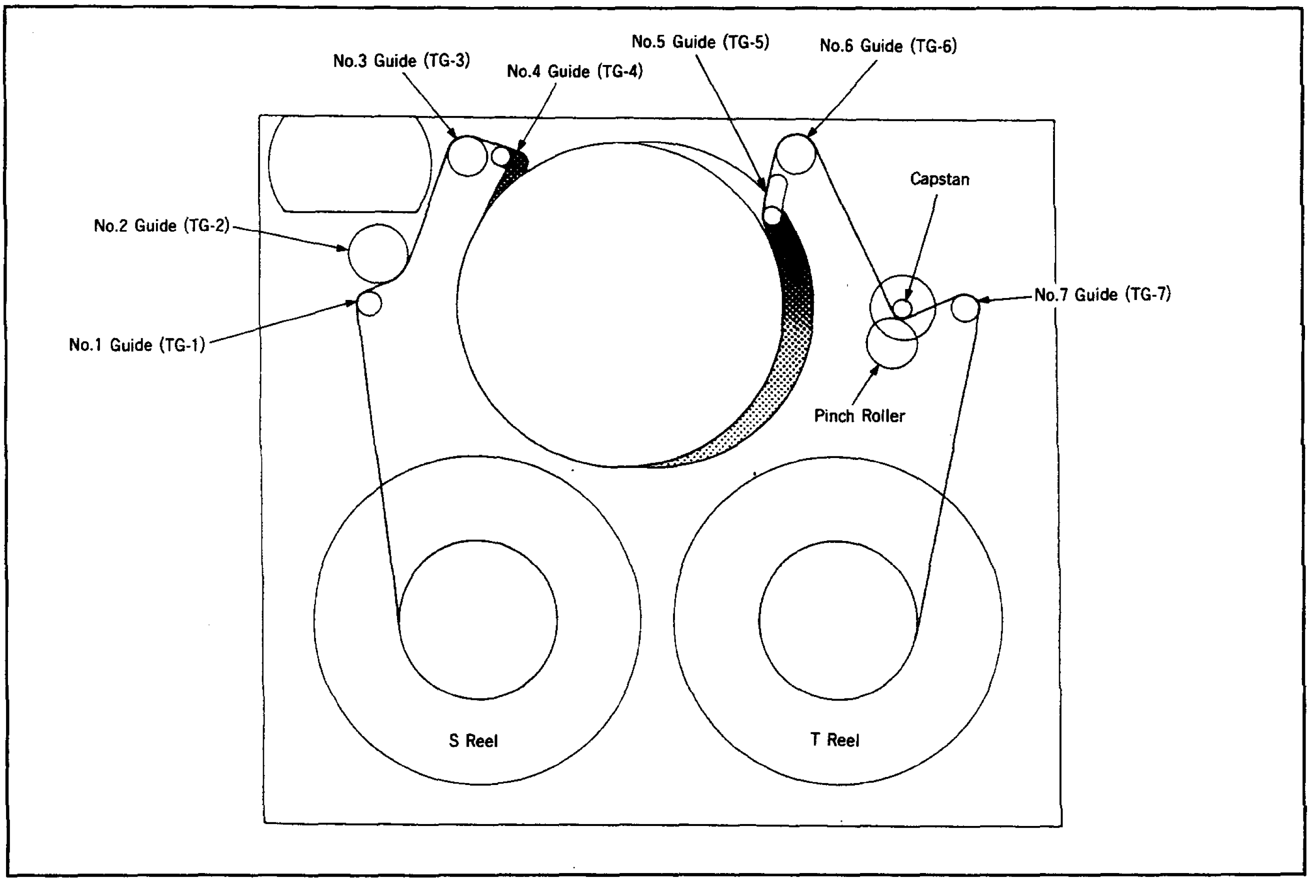


Fig. 34-A

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig.41).

Therefore, when performing section 4-4. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-6), modified as follows, and perform adjustment in playback mode.

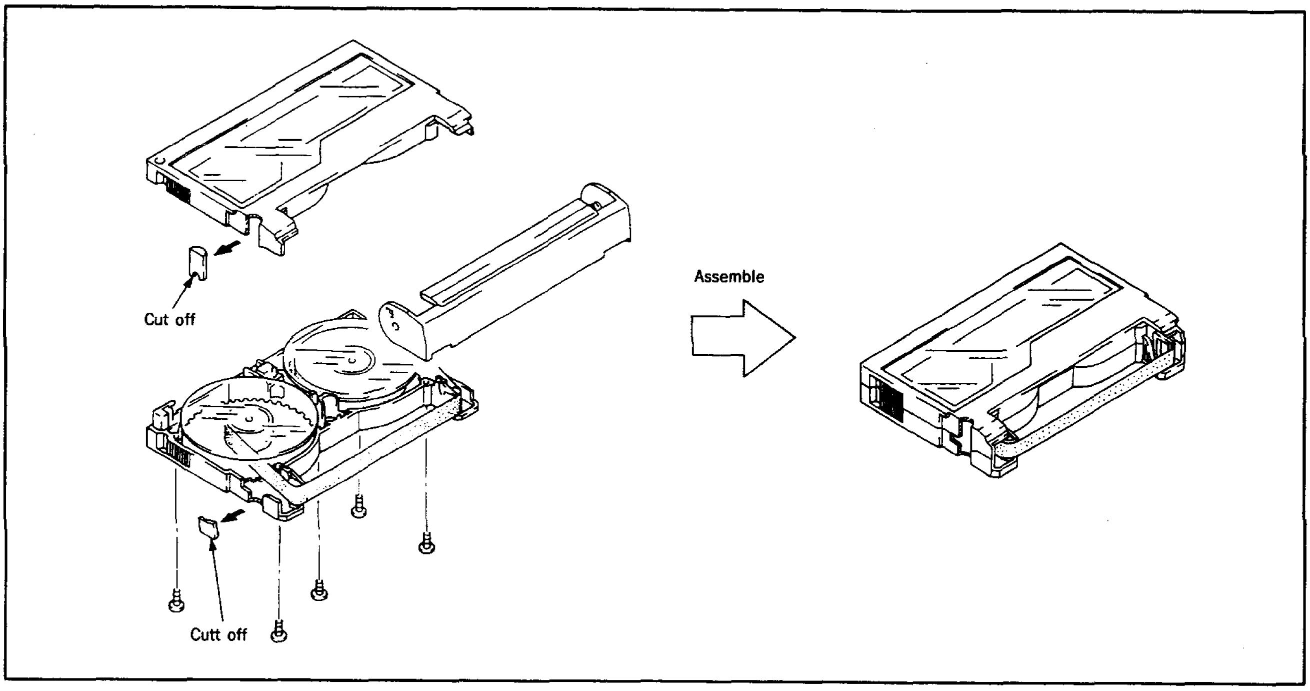


Fig. 34-B

4-1. PREPARATION FOR ADJUSTMENT

1) Clean the tape running surface (tape guides, drum, capstan shaft, pinch roller) (Fig. 34-A).
2) Set the PATH mode using the adjusting remote controller.
3) connect an oscilloscope to the check pin connector of the set.
   Example) For CCD-FX410 series
   CH1 : CN001 pin ③ (PB RF OUT) on CS-31 board
   CH2 : CN001 pin ④ (RF SWP) on CS-31 board
4) Play back a tracking alignment tape (NTSC : WR5-1N, or PAL : WR5-1C).
5) Check that a RF waveform is flat at the inlet and outlet of the oscilloscope (Fig. 35 ⓐ).
   If not flat, make adjustment with the procedures below.
   When the RF waveform is not flat at the inlet/outlet ; See Fig. 35 ⓑ and ⓒ.

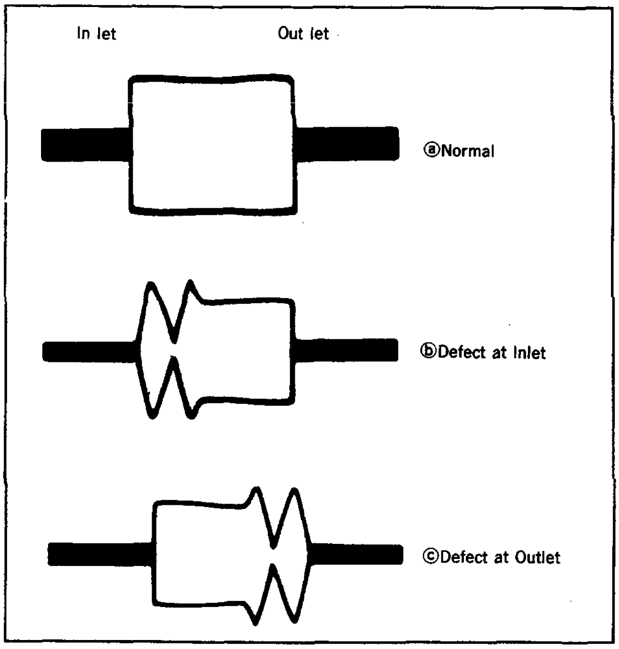


Fig. 35

4-2. TRACKING ADJUSTMENT (Fig. 36, 37)

1) Play back the tracking alignment tape.
2) Loosen the No.3 guide (TG-3) lock screw 1 and turn the No.3 guide to flatten the waveform at the inlet.
3) Tighten the No.3 guide (TG-3) lock screw 1 to lock the No.3 guide.
4) Loosen the No.6 guide (TG-6) lock screw 2 and turn the No.6 guide to flatten the waveform at the outlet.
5) Tighten the No.6 guide (TG-6) lock screw 2 to lock the No.6 guide. When this is done, make sure that the waveform does not change at the outlet.

Note : Be careful not to loosen the lock screw too much because the guide is easily moved.
: Take care not to allow interference between No.6 guide and drum when tightening the No.6 guide lock screw.

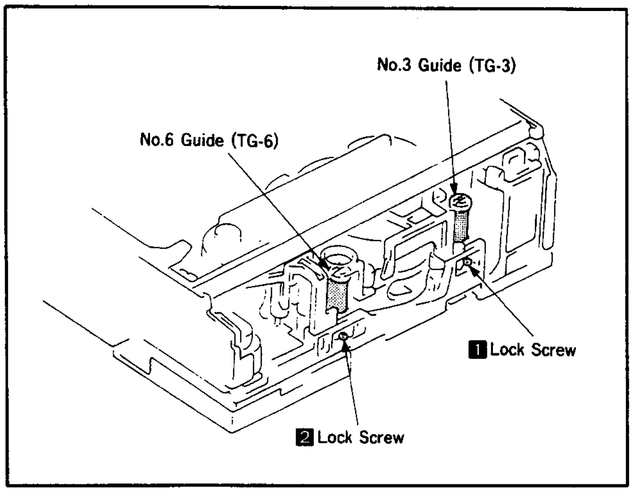


Fig. 36

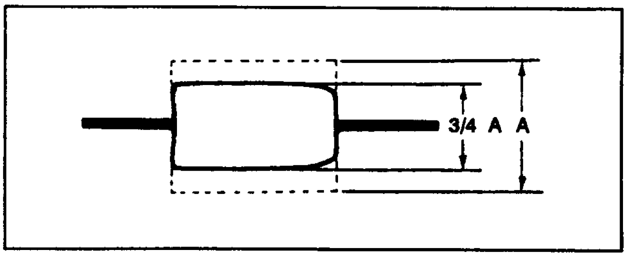


Fig. 37

4-3. No.2 GUIDE (TG-2) ADJUSTMENT

When the No.2 guide has been turned or replaced, perform height presetting before this adjustment.

4-3-1. No. 2 GUIDE (TG-2) HEIGHT PRESETTING (Fig. 3

1) Rotating the TG-2 upper flange, adjust the height of bottom face of TG-2 lower flange from the top face of dowel on the mechanical chassis to 3.3 ± 0.05 mm.

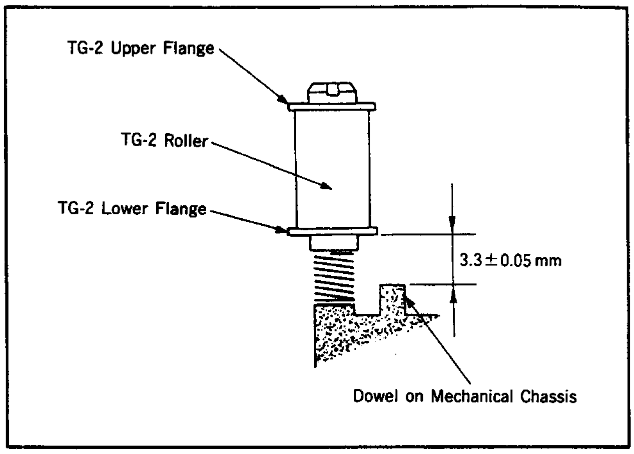


Fig. 38

[Reference]
This A mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7) . To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Clockwise
	Lower	Counterclockwise

4-3-2. No. 2 GUIDE (TG-2) ADJUSTMENT (Fig. 39, 40)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No.2 guide (TG-2) ❶ (Fig. 39). If it is, turn the upper flange ❸ of the No.2 guide (TG-2) clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and trcking fine adjustment as described in sections 4-2.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (Fig. 40), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90° counterclockwise and repeat step 5.

   Repeat steps 5) and 6) until a normal waveform is obtained.

   Then, confirm that the tracking waveform has not changed.

   If it has, perform fine adjustment of entrance side tracking and repeat step 5).

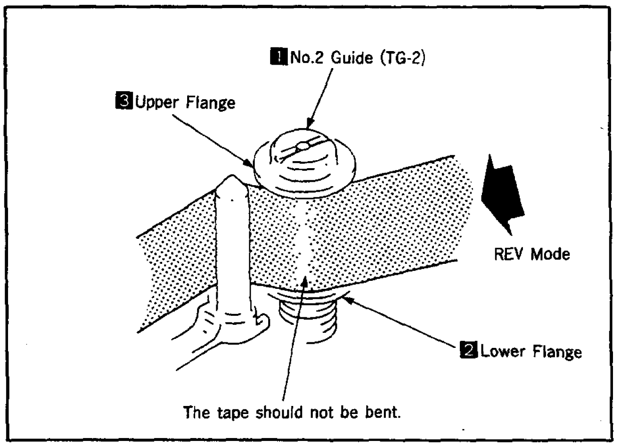


Fig. 39

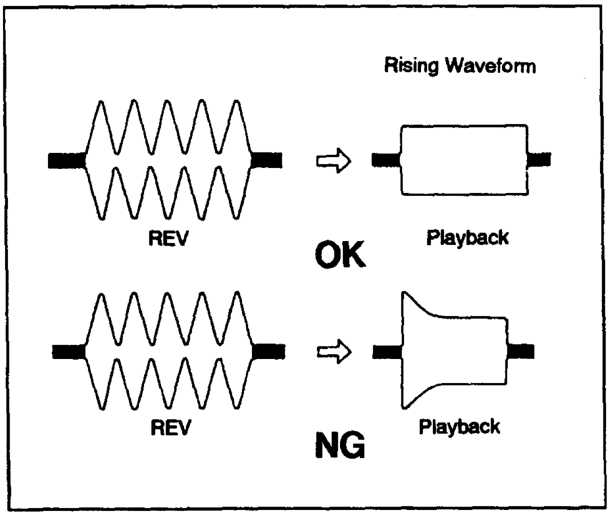


Fig. 40

4-4. No.7 GUIDE (TG-7) ADJUSTMENT (Fig. 41)

Note : This adjustment requires the No. 7 guide adjusting cassetetape (Fig. 34-B).

1) Play back the No.7 guide adjusting cassetetape and set the REV mode.
2) Confirm that the tape is not bent between the No.6 guide (TG-6) ❶ and the capstan ❷. If it is, turn the hight adjusting screw❹ of the No.7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No.7 guide (specification : 0.5mm or less). If the tape is bent beyond the specification, turn the No.7 guide (TG-7) ❸ until bending is within the specification (0.5mm).

   If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3mm or less, adjustment can be considered completed.

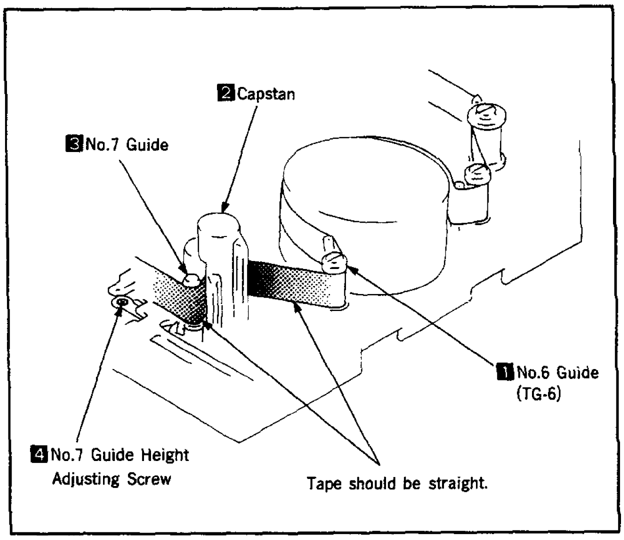


Fig. 41

4-5. CUE AND REV WAVEFORM CHECK (Fig. 42)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (Fig. 42). In case pitch is not constant, perform section 4-2.Tracking Fine Adjustment and section 4-4. No.7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (Fig. 42).

   Otherwise, perform section 4-2 Tracking Fine Adjustment.

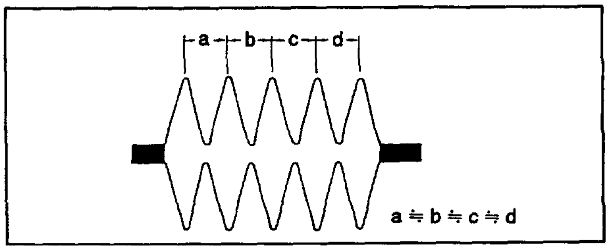


Fig. 42

4-6. CHECK AFTER ADJUSTMENT

4-6-1. TRACKING CHECK

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (Fig. 43).
2) Then, confirm that the minimum amplitude value (EMIN) is 65 % of the maximum value (EMAX) or larger (Fig. 44).
3) Confirm that no large fluctuations occur on the waveform (Fig. 45).

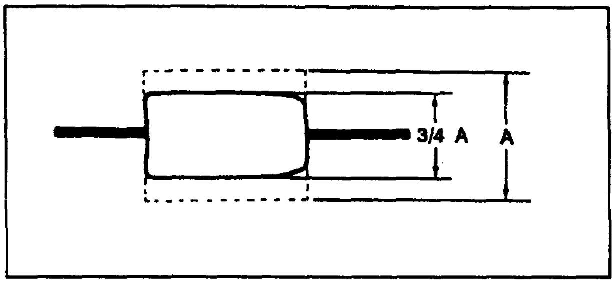


Fig. 43

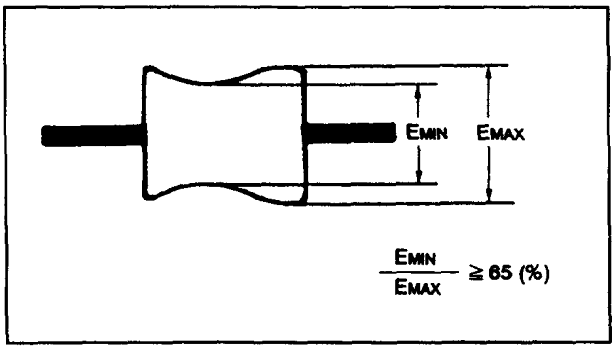

EMIN
EMAX
$\frac{E_{MIN}}{E_{MAX}} \geqq 65$ (%)

Fig. 44

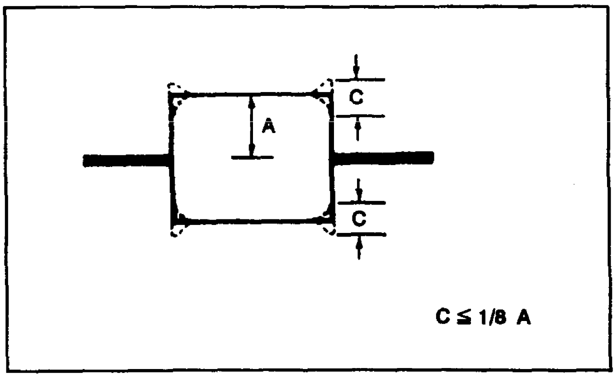


Fig. 45

4-6-2. RISING CHECK (Fig. 46)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) **Set the playback mode and confirm that the RF wave form rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.**
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds, Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.

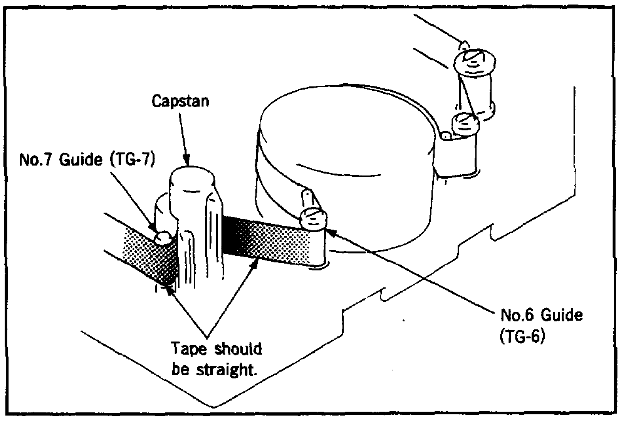

Capstan
No.7 Guide (TG-7)
No.6 Guide (TG-6)
Tape should be straight.

Fig. 46

4-6-3. TAPE PATH CHECK (Fig. 47)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3mm, at the lower flange of the No. 2 guide , the upper flange of the No.3 guide, the upper flange of the No. 6 guide and the No.7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3mm at the flange of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

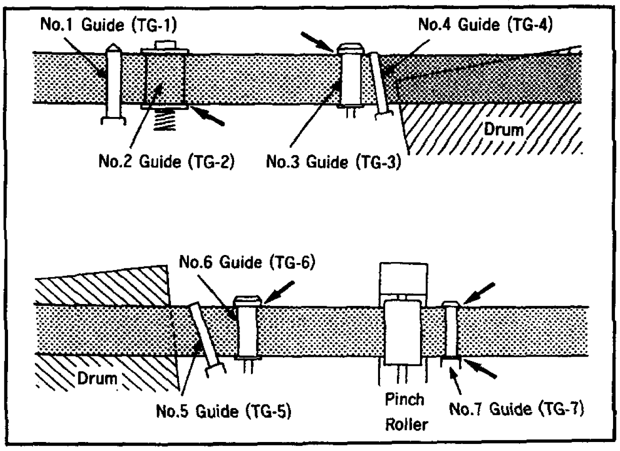

No.1 Guide (TG-1)
No.4 Guide (TG-4)
Drum
No.2 Guide (TG-2)
No.3 Guide (TG-3)
No.6 Guide (TG-6)
Drum
No.5 Guide (TG-5)
Pinch Roller
No.7 Guide (TG-7)

Fig. 47